From

COOKING VESSELS TO CULTURAL PRACTICES

in the Late Bronze Age Aegean

Edited by JULIE HRUBY and DEBRA TRUSTY

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Front cover: Minoan-style cooking pots made by Jerolyn Morrison; photo by Chronis Papanikolopoulos
Back cover: Photo by Walter Gauss, digital remastering by Rudolfine Smetana

Contents

References

Preface

The study of the production, trade, and consumption of cooking vessels represents a long-standing lacuna in prehistoric Aegean archaeology. Until recently, cooking vessels were typically mentioned in passing in works that focused primarily on decorated fine ware and other archaeological remains. This volume is an attempt to remedy that situation and is entirely dedicated to the study of prehistoric cooking vessels through comparative methods. It is the product of a panel that was organized by the editors for the 115th Annual Meeting of the Archaeological Institute of America, which took place in January 2014. Since that time, we have added chapters from a selection of other scholars whose work fits well with that of the initial participants.

We would like to thank the many people without whose assistance the production of this volume would have been impossible. All our contributors refereed each others' papers. Jeremy Rutter kindly read and provided feedback on the contents of all the papers. Too many people to count, let alone name, have provided stimulating discussions and bibliographic recommendations on the topic. Daniel Pullen provided advice on formatting. E. M. Thompson provided copy editing assistance, and two successive associate deans of the arts and humanities at Dartmouth College, Adrian Randolph and Barbara Will, provided funding that enabled us to hire her. We would also like to thank all the people at Oxbow who have been so patient with our project, including Clare Litt, Julie Gardiner, Mette Bundgaard, Hannah McAdams, and Katie Allen. We both would like to thank our colleagues for their encouragement. Debra would like to express her appreciation for the support of her partner Jason Taber and Julie for her partner, Eric Chatterjee. The editors take full responsibility for whatever flaws inevitably remain.

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1

Approaches to Bronze Age Greek cooking vessels

Debra Trusty and Julie Hruby

The humble cooking pot?

As we brought this volume together, a consensus emerged among the contributors that more attention should be dedicated to Aegean cooking vessels. We maintain that cooking wares reflect economic, political, and social developments, much as painted fine wares do. Additionally, they answer questions about culinary culture that painted fine wares cannot, especially when cooking vessels are examined diachronically, inter-regionally, or in other comparative ways. In this introductory chapter, we discuss some of the obstacles that our contributors have had to overcome, offer some solutions, and suggest future research topics. Our hope is that by recognizing these issues, scholars can begin to collaborate to develop a better understanding of this under-researched class of Bronze Age Aegean functional ceramics.

Definition

There is a long history of variability in how archaeologists choose to define, identify, and classify cooking vessels. These pots can be found in categories including "coarse ware" (French 1961), "domestic ware" (Blegen 1921; Dalinghaus 1998), "unpainted vessels or wares" (Blegen 1928; French 1965), "plain ware" (Wace *et al*. 1921/1922–1922/1923), and "kitchen fabrics" (Catling 2009). Other scholars prefer to separate them entirely from other ceramic fabrics (Stubbings 1947). Michael Galaty, who has also written the concluding piece for this volume, recognized that there is often a very fine line between traditional coarse wares and the fabrics used for cooking functions, a situation that is bound to result in unnecessary confusion (1998, 102). By failing to come to a consensus in our definitions, we have inadvertently impeded our ability to understand the impact such vessels had in the ancient world.

Unfortunately, this situation has not changed, and no unambiguous definition of cooking vessels has been postulated for the Aegean. We would therefore like to begin this volume by proposing a working definition: cooking pots are ceramic vessels designed to resist thermal shock and maintain toughness despite

repeated exposure to temperature changes.[1]

Clearly, there are vessels used for functions beyond food preparation that fit into this category; ceramics used for metallurgical or perfume production, for example, also technically fit within the definition, though their contents would not have been intended for ingestion. Similarly, lamps may have evidence of sooting (*e.g*. Evershed *et al*. 2000), yet their contents are not foodstuffs. Nonetheless, the shared performance characteristics of such vessels suggest that it may prove useful to discuss them alongside cooking pots in the future. For this volume, however, we have limited the discussion to vessels used to transform food with heat. We acknowledge that the identification of such vessels can be problematic, especially in contexts for which there is not yet an established typology.

Challenges

Scholars who work with ancient cooking pots face a range of challenges. The first is preservation. Cooking pots were made with the primary goal of withstanding thermal shock during their useful lives, not of long-term preservation. They were as a result deliberately fired at lower temperatures in order to increase their ability to withstand exposure to thermal shock (Hein *et al*. 2008). The amount and size of temper is proportionally higher than that in fine wares, which increases the toughness of the vessel and provides resistance to shock.[2] At the same time, however, it creates a fabric that is more susceptible to abrasion and deterioration during its use and deposition (Müller *et al*. 2010). In fact, the necessary functional constraints required the producers of cooking vessels to have a clear understanding of the properties of both clay and temper (Skibo 2013, 7). The result, then, was a product that fulfilled its purpose successfully but was less likely to survive use, discard, and subsequent excavation, especially when the walls of the vessel were thin (*e.g*. the bottoms of Minoan cooking dishes).

A second contributor to the current lack of data may be ancient recycling practices. In the Medieval Middle East, sherds were sometimes ground into gravel and used to cover garden paths (Milwright 2001, 77). If cooking pots were utilized in this way, their low-fired nature would have made them less likely to survive the experience than other ceramic types. In similar contexts, discarded cooking pots were also employed as abrasives for cleaning pots, and pulverized for medical use for both humans and horses (Milwright 2001, 78, 80). The same may have been true in antiquity. Though ground sherds have been used in the form of grog to temper ceramics at times, that does not seem likely to have played a substantial role in the paucity of Late Bronze Age cooking pots available for study, given that grog was primarily used in the Neolithic and Early Bronze Age in Greece rather than in the Late Bronze Age (personal communication, Evangelia Kiriatzi). Sherd material is also found used in prehistoric plaster (LaFayette 2011), and it is possible that cooking pots may have been recycled in this context.

The third factor is archaeological practice. From the beginnings of the field into the 1970s, Aegean prehistorians focused their fieldwork primarily on excavating palaces and tombs (*e.g*. Schliemann 1878; Stubbings 1947, 2–8). While both architectural categories sometimes contained cooking pots (*e.g*. Stubbings 1947, 54; Blegen and Rawson 1966, 383–384), this functional class seems to be less common in these contexts than in the settlements and structures outside the fortification walls. Also, because cooking vessels tend to be fragmentary, cooking vessels from settlement contexts have been less well studied (French 1963, 44).[3] Additionally, unknown quantities of ceramic material excavated before World War II have been lost, so cooking pots that were originally retained have become unavailable (French 1963, 44). Furthermore, we know that cooking vessel fragments, in addition to other plain ware vessels, were differentially discarded from excavations at major sites such as Mycenae (personal communication, Kim Shelton), Korakou (Rutter 1974, 29), and Kos (Vitale and Morrison, Chapter 8) up through the 1950s.[4] This practice has sometimes continued up to the present day. Such procedures may have been justified intellectually on the grounds that

cooking vessels lacked decoration and hence did not lend themselves to extensive decorative classification and fine chronological precision. In addition, storage space within museums and storerooms is frequently limited and as a result, only a limited quantity of material can be retained for posterity. Unfortunately, regardless of the manner in which these artifacts were discarded or destroyed, the contextual information represented by their loss can never be regained.

These collection and selection methodologies have altered assemblage proportions and created substantial gaps in the archaeological record. For example, it is now impossible to reconstruct the full range of material from the Atreus Bothros at Mycenae, despite the fact that it contained habitation debris, given that the only ceramics that survived World War II were decorated fine wares (French 1963, 45, n. 9). Due to this kind of absence of evidence, archaeologists can make sweeping generalizations without the material challenging them. For example, some past scholars have assumed that the added complexity of painted fine wares made them more time-consuming and technologically challenging to produce, and that many types of coarse ware vessels were only produced locally and would not have been exchanged beyond their immediate production zones. This was certainly not the case; Aeginetan ceramics in particular were widely traded (Gauss 2010, 746–747), and contrary to many scholars' expectations, fine ware containers may have been less costly than coarse ones when mass-produced (Galaty 1999, 47). These assumptions have allowed some (*e.g*. Wace and Blegen 1939, 131–147; Riley 1982) to focus entirely on decorated pottery as a chronological and regional indicator, interpreting decorative and morphological changes as reflections of the changing social and political power of Minoan or Mycenaean rulers, and justifying detailed description (*e.g*. Stubbings 1951; Taylour 1958; Mountjoy 1986). By contrast, we prefer to address a broader range of issues, including trade, production technologies, culinary technologies, trade networks, and so on.

Understanding the relationship between form and function

To better understand cooking vessel shapes and fabrics, it is necessary to reconsider the vessels' functional roles. After all, both shape and fabric contribute to functionality. Fabric has typically been studied, whether macroscopically, petrographically, or chemically, with an eye to identifying aspects of the production process including tempering, clay mixing, and firing. These analyses have also been used to detect the provenience (or at least restrict the range of possible proveniences) of vessels and specific production groups (see Trusty, this volume). As noted above, cooking pots are identified by their clays, inclusions, and abilities to withstand thermal shock, but how then do we approach fine ware shapes like kylikes or other types of ceramic objects like Linear B tablets that were made in what would seem to be cooking fabrics (*e.g*. Blegen and Rawson 1966, 352; Lis 2016; personal observation)?

We can apply Skibo's approach of analyzing "use-alteration" to ceramics to examine the functions of cooking pots (2013, 2). Use-alteration includes sooting, surface attrition, and the deposition of residues. Fabrics can reflect post-production utilization processes, especially in the case of cooking pots, where different fabrics may respond in radically different ways to problems of heat transfer and retention. Heavily used cooking ware is often transformed, blackening over time, and it may become increasingly vitrified if used over high heat. The study of surface attrition and sooting has only just begun to come into its own (*e.g*. Hruby 2006, 43–44; Yasur-Landau 2006a; 2006b; Lis 2010b; Rutter 2013). Topics for future investigation include the extent to which use-alteration might be required to demonstrate function, versus to what extent cooking pots may be identified by their fabric qualities and inclusions. In addition, it may prove helpful to ask how effectively these characteristics separate cooking fabrics from other fabric types, especially storage fabrics.

Residue analysis has occasionally been undertaken in the Aegean (*e.g*. Evershed *et al*. 2000; Tzedakis *et al*. 2008; Urem-Kotsou *et al*. 2008), and it need hardly be said that this approach offers a promising avenue

for analysis. This will be particularly true once we are able to move beyond the stage of identifying the contents of specific vessels, toward building a database that makes it possible to quantify the kinds of regional and chronological trends in foodways that we are currently merely able to suspect. From there, we can begin to discuss the relationship between foodways and local and regional cultures and environments. Such studies may also provide us with a stronger comprehension of food preparation technologies and techniques.

One of our most effective tools is experimental replication (*e.g*. Morrison 2011; 2015; Moody *et al*. 2012). By duplicating shapes and fabrics, we can replicate food preparation technologies, allowing us to discuss the relationship between foodways and culture. Questions we might ask include how vessels reflect the identities of chefs or the identities and preferences of consumers. Does variability within or among cooking pot assemblages reflect regional or class or gender identity, demonstrated through specific culinary styles, tastes, and manners?

There is clearly a great deal more work to be done to build increasingly broad and detailed pictures of sources of ceramics and of the distributions of vessels from those sources. Fortunately, archaeologists in this field are better able to solve more problems today than ever before, due in large part to improvements in excavation techniques, enhancements in ceramic analysis, and advances in archaeological sciences. Such methods will help us identify, define, and describe cooking fabrics in the field, in storerooms and museums, and in publications. As the details become increasingly clear, it should eventually become possible to discuss production centers and distribution patterns oriented around these vessels on household, site, and regional scales.

Building typologies

As an understanding of the relationship between fabric and function is established, it is also important to create typologies based on shape, fabric analysis, and use-alteration studies. To date, little scholarship has been dedicated to identifying of the range of cooking shapes (notable exceptions include Betancourt 1980; Hallager and Hallager 1997; Dalinghaus 1998; Lis 2012b). Furthermore, scholars have not agreed on standards to use when describing cooking vessels. Because shape-based typologies have sometimes been created in methodologically uncritical ways and detailed typology-building has been an obsession of previous generations, this exercise may be perceived to be unsound, or possibly even boring. Unfortunately, those scholars who did build early typologies did not fully incorporate cooking vessels. For example, Furumark fails to fully incorporate griddles into his typology, apparently because most of the examples that had been discovered at the time he wrote were insufficiently complete to provide him with an overall vessel shape and were, in any case, not in the contexts of material on which he based his corpus (1972).[5]

Despite this challenge, we must accept that well-built and robust typologies, both etic and emic, are critical tools for identifying and describing cooking vessels. Such typologies can help us build the foundations of understanding the chronological, spatial, and functional relationships between artifacts and people. While uncritical typology building has, with good reason, been treated with suspicion by many of our anthropologically-trained colleagues (see Kempton 1981 for a discussion), the form of a vessel is one of the major constraints on its range of potential functions; mechanisms for efficiently identifying, describing, and naming forms are essential tools.

As we construct these typologies, we can answer a range of more specific and culturally significant questions. These include the chronological and regional distribution of each shape, and how shifts in preferences for different vessel shapes reflect external geopolitical or trade relations, either within the Aegean or with neighboring regions. Further, we can look at whether specific cooking vessel types are characteristically found only in elite contexts or throughout the entire socioeconomic spectrum. We can also

identify what kinds of cooking may have taken place in religious, commercial, and communal contexts, as opposed to what kinds took place in strictly domestic contexts.

Filling the void

We see great potential for improvements in the study of cooking wares also emerging from a humble but critically important source: increasing numbers of publications containing the most basic of information, including measurements, photographs, illustrations, and contextual data. Only when a larger data set is available can we fully consider the broader implications of cooking pots, including their qualities, frequencies, production methods, trade, and use.

Today, the study of cooking vessels has become such a flourishing enterprise that we happily constrained the scope of this volume in numerous ways: first, chronologically to the Late Bronze Age, and then methodologically to approaches incorporating the study of shape and fabric but excluding residue analysis, which presents a different set of challenges. This volume begins to fill the need for a text that is entirely dedicated to Aegean Bronze Age cooking vessels and compiles evidence from a wide range of sites. Each chapter focuses on cooking vessels from sites in Greece or in places impacted by prehistoric Greek ceramic culture. These sites include major citadels and smaller settlements throughout the Aegean and surrounding Mediterranean area, including the Greek Mainland, the Cycladic islands, Crete, Italy, and Cyprus. The primary goal is to investigate the potential for Minoan and Mycenaean cooking vessels to illuminate important economic, political and social issues in Mediterranean prehistory. These include craft production techniques, trade, and consumption on a range of different scales. Increasing attention to socioeconomic questions over the last few decades makes this an opportune time to reconsider prehistoric cooking vessels. Chapters within this volume utilize a variety of analytical techniques and methodologies to demonstrate the impact that cooking vessels can have on the archaeological interpretation of sites and of their inhabitants.

First, Debra Trusty (Chapter 2) surveys the history of scholarship on prehistoric cooking wares. She begins with Heinrich Schliemann's depictions of prehistoric tripod cooking pots at Troy, then discusses the approaches of scholars working at different sites in Greece in the early 20th century, including the role of Arne Furumark's typology. This is followed by an analysis of the current situation in which scholars of cooking vessels find themselves, dealing with a growing supply of information. Additionally, Trusty contrasts the state of scholarship on prehistoric Aegean cooking wares with that of other contexts, including Classical Greek and Native American, noting that the scholarship of Aegean prehistorians has sometimes tended to lag.

Julie Hruby (Chapter 3) examines the development of class-differentiated cuisine over time, using specialized cooking pots as a proxy for the development of haute cuisine. She identifies the Late Helladic III period as one of culinary innovation, based on the introduction of both the griddle and the "souvlaki tray." She uses experimental approaches to investigate how culinary technologies functioned and therefore to understand how cuisine changed over time.

These articles precede a geographical look at individual sites around Greece and Crete. Starting in the west, Joann Gulizio and Cynthia Shelmerdine (Chapter 4) contrast two phases of cooking pot assemblages at Iklaina, those before and after the probable incorporation of the site into the Pylian state in LH IIIA2 early. They restrict their study to three specific vessel types (spit supports, griddles, and tripods) in order to demonstrate how the inhabitants of Iklaina experienced changes in cooking and eating habits at a time of political change. They find some evidence that might suggest a decrease in the frequency of spit support and tripod use after that transition.

Bartłomiej Lis (Chapter 5) compares cooking pots from three different sites in Central Greece and the Peloponnese: Mitrou, Tsoungiza, and the Menelaion. He observes shifts from the Early Mycenaean period to

the Palatial period and from the Palatial period to the Post-Palatial period, with a trend toward increasing uniformity not only at the first transition but also, more surprisingly, at the second. The first period of homogenization, he argues, symbolizes the emergence of a *koinè* style among cooking pots brought on by the rise of the palaces and increased communication between settlements. The second transition, however, marks a return to simpler shapes and not the specialized forms used in more upscale (*i.e.* palatial) contexts, continuing the trend toward morphological standardization by subtraction from, rather than addition to, the range of forms.

Walter Gauss, Evangelia Kiriatzi, Michael Lindblom, Bartłomiej Lis, and Jerolyn Morrison (Chapter 6) shift focus from the Mainland to the adjacent island of Aegina, long known to have been heavily involved in cooking pot production and export. Their discussion fills a chronological gap in the analysis of Aeginetan cooking pots, that from Late Helladic II through the Early Iron Age. They discuss material from an LH IIIA kiln as well as exported vessels found on the Mainland, finding that fabrics become more variable during the Late Bronze Age, perhaps reflecting an increased number of producers as well as the use of a wider range of clay sources from the island.

Evi Gorogianni, Natalie Abell, and Jill Hilditch (Chapter 7) turn our attention to the island of Kea, where they use cooking vessels as a proxy for culinary technologies and provide much-needed information on cooking vessel fabric characteristics on a macroscopic scale. They argue for a more nuanced understanding of the process of Minoanization, arguing that it has been overstated due to a combination of biased discard practices and the incomplete description of Mainland vessels. They identify shifts in cultural traditions as they examine Minoan, Mycenaean, and local adaptations.

Salvatore Vitale and Jerolyn Morrison (Chapter 8) examine the culinary technologies of Kos, presenting an overview of the Bronze Age storage and cooking pot assemblages and evaluating the Late Bronze Age processes of Minoanization and Mycenaeanization. They find that all retained food preparation and storage vessel sherds were likely to have been of local manufacture and that Late Bronze I cooking vessels were typically coil-built and wheel-fashioned, while Late Helladic IIIA2 through Late Helladic IIIC vessels included also some wheel-thrown examples. They discover that while Minoanization was a brief phenomenon, exerting no apparent influence on ceramic fabrics or technologies, Myceneanization had a substantial impact on manufacturing technologies as well as on typologies.

Jerolyn Morrison (Chapter 9) surveys the evidence for cooking at Neopalatial and Final Palatial Mochlos. She sees shifts in ceramic types, such as the introduction of larger tripods and of new rim shapes on cooking dishes at the transition to the Final Palatial period, but she finds that even where the cooking and serving pot types (and so presumably the style of food production and consumption) shifted, the foodstuffs themselves apparently did not. She also discusses a shift from primarily indoor cooking spaces to a greater level of balance between indoor and outdoor cooking spaces.

Elisabetta Borgna and Sara Levi (Chapter 10) examine the cooking vessels of Post-Palatial Crete and contemporaneous ones from Italy, finding that while Mycenaean ceramic forms are generally quite popular in Italy, the same is not true of cooking pots. The reverse is also partially true; only a limited number of Italian shapes appear in Cretan contexts. Also, the use of hearths with potsherd or pebble beddings and of pit-hearths or sunken ovens in the Aegean seems to follow chronologically that in the Central Mediterranean, suggesting that levels of cultural exchange reached well beyond the highest level of elites.

Reinhard Jung (Chapter 11) shifts our attention to the East, where he demonstrates that there is a substantial shift in Cypriot cooking ways at many sites between the Late Cypriot I-II period and the Late Cypriot III period. Cooking pots change in morphology with the introduction of several Mycenaean shapes and in manufacturing methods from handmade to wheelmade; hearths shift from relatively simple features that might be only flat spaces or shallow pits to elaborate built structures. The two shifts seem to occur simultaneously and are based on functional constraints. It seems likely that the shifts in such a private realm

as cooking practices reflect immigration at the Late Cypriot IIC to III interface.

Mike Galaty (Chapter 12) provides the book with its conclusion, in which he advocates for the definition of research questions as we shift from descriptive to interpretative perspectives. He uses Eastern North American strategies for analysis of cooking vessels as a comparandum, contrasting the cultural-historical and processual approaches that have taken root among archaeologists working in that region with the frequently descriptive approaches used in the Aegean. He recommends that all coarse pottery be kept (including what might not have been considered "diagnostic" in the past), that we develop and use a shared terminology and classification system, that summary data should be presented and statistical analysis undertaken, that we adopt hypothesis testing, and that we adopt a ceramic-ecological research framework.

Notes

1 See Tite *et al*. 2001 for a technical discussion of toughness, which is basically the ability of a ceramic object to resist propagating cracks.

2 Tempers in LBA cooking pots are often sand, rather than the shell and grog tempers that are common in other contexts; the impact of temper type on toughness is unclear, due in part to problematic testing regimes and in part to insufficient numbers of tests (see Tite *et al*. 2001, 309–313), as is its impact on wear over time.

3 Though even those settlement contexts that were excavated were not always initially published with cooking wares (*e.g*. Wace 1956). On the other hand, some did (*e.g*. Blegen 1921; Goldman 1931), though obviously as with other materials, not necessarily with the level of detail that a modern scholar might prefer.

4 By contrast, cooking vessels from Tiryns seem not to have been differentially discarded, making this site a potential goldmine for building an understanding of Mycenaean elite culinary practice (our thanks to Joseph Maran and Martina Riedl for this information).

5 *Contra* Dalinghaus 1998, 136 and Baumann 2007, 161, the shape Furumark identifies as a baking pan is clearly different from the griddle shape, insofar as he makes no mention of indentations and the image he uses reflects short walls and short horizontal handles, unlike other examples of griddles (1972, 75, 76); it is probably not an accident that he discusses it under "cooking pots" and not under a heading like "perforated vessels."

2

Undervalued and overlooked: The study of Minoan and Mycenaean cooking vessels in the Bronze Age south and west Aegean

Debra Trusty

The study of cooking vessels in Bronze Age Greece[1]

It is not surprising to say that publications on Aegean Bronze Age cooking vessels are few and far between. Only a handful of studies have focused on the production, trade, and other characteristics of Late Bronze Age Aegean cooking pots, and even fewer have discussed the important conclusions that can be made from such studies. Many of the reasons for this gap in scholarship have already been discussed in Chapter 1, but it is important to look back on the history of the archaeological treatment of Bronze Age cooking vessels. By surveying the spectrum of methodologies and approaches we can begin to appreciate the current difficulties faced by those studying these vessels. The sources discussed throughout this chapter do not represent a comprehensive list, but are a sampling of the growing number of studies on cooking vessels. Scholarship on types of foods is not discussed unless it directly addresses the shape and significance of cooking vessels dating before the Byzantine period.

The dawn of archaeology and the downfall of coarse wares

One of the earliest mentions of prehistoric Aegean cooking pots occurred in Heinrich Schliemann's 1880 publication of his excavations at Hisarlik, in which he recorded the discoveries of several tripod vessels, including three from Troy IV (Fig. 2.1). Although these vessels date much earlier than the Late Helladic (LH) period, Schliemann's treatment of them was unique. He provided drawings and lengthy descriptions of the construction methods of these vessels, such as whether they were wheel-made and how the legs and handles were attached to the body (Schliemann 1880, 544). While it is hard to determine if these tripods are cooking

vessels, his description of a vessel from Troy I seems consistent with cooking ware fabric:

> Some… have become soft from damp … [They] are hand-made, and consist, as usual, of coarse clay, mixed with silicious earth and pounded granite, containing much mica; they have, apparently been baked only once very imperfectly at an open fire, and were not covered over with fine clay; nevertheless, owing to the oxide of iron contained in their clay, they have a dull red color. They have suffered so much from moisture, that, in spite of every care and precaution, I could not get them out without breaking them up completely; but as I had collected all the fragments, I could easily restore both of them. (Schliemann 1880, 227)

His report is by far the most extensive account of cooking vessel fabrics we have for another 50 years.

After World War I, Carl Blegen published his volume on the Korakou excavations (1921), creating the standard that all other archaeological publications on prehistoric Greek artifacts would follow for several decades. While a significant number of whole vessels and fragments were preserved from the LH IIIC houses identified at the site (as described in Rutter 1974), it seems that unknown quantities of coarse wares were discarded after the excavation of the stratified East Alley deposit (Rutter 1974, 29). This practice affected how later scholars looked at cooking vessels. For example, Arne Furumark (1941) did not include any cooking vessels from Korakou in his ceramic typology. Those sherds and vessels that were preserved still received attention in Blegen's publication, though it was minimal, with short descriptions and a few photographs. One innovative addition to the study of domestic pottery, however, was Blegen's inclusion of drawings of rim shapes. While little information on the chronological changes of these vessels is provided, Blegen's most significant observation was that round, raised-based jars regularly occurred in LH I–II contexts but were nearly invisible by LH III (1921, 73–74). This observation continued to be the only means for dating cooking vessels until the 1950s, when more extensive publications were produced.

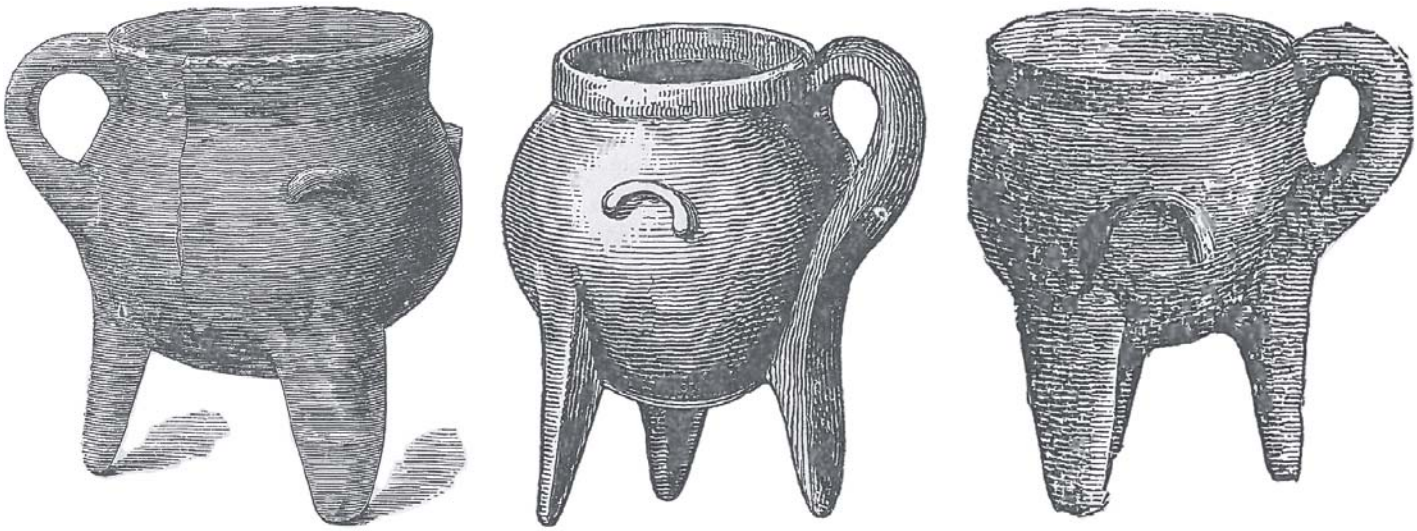


Figure 2.1. Tripod cooking vessels from Troy IV. Not to scale. (Schliemann 1880, 530–531 and 544. From left to right: nos 1032, 1033 and 1130)

Contemporary with Blegen's work, Alan Wace and his colleagues published brief but more informative descriptions of cooking vessels found at Mycenae. While they lacked consistency in terminology, alternating between "cooking ware" and "coarse domestic ware," the excavators listed and described sherds from each

deposit, noting the vessels' shapes and the presence of potters' marks (Wace *et al*. 1921/1922–1922/1923). Wace's format was standardized and formulaic, appearing more like a catalog and less like Blegen's narrative style. Additionally, these publications provided some of the earliest published photographs of cooking vessels, including a fully restored tripod from the granary at Mycenae (Fig. 2.2).

The discovery of a large stock of cooking "casserole dishes," braziers, scoops, and lids in the basement of the "Potter's Shop" at Zygouries marked a turning point in the way that prehistorians treated cooking vessels. Blegen devoted several pages of text and included photographs in order to describe the nearly 700 cooking vessels, placing them in the "unpainted ware" portion of his publication (1928, 157–162). More recently, the exact number of semi-globular cooking pots found inside the structure has been questioned, potentially cutting the number in half (Thomas 1992, 329). Nevertheless, the shapes of the vessels were discussed individually, and the discussion included a characterization of the fabric (color, texture, and hardness) and surface treatment, as well as basic dimensions. While this documentation was a necessary step toward understanding cooking vessels, it seems likely that these pots received significant attention because they were found in such large numbers, including several whole vessels. As a result, these artifacts were more appealing to display in museums and publications.

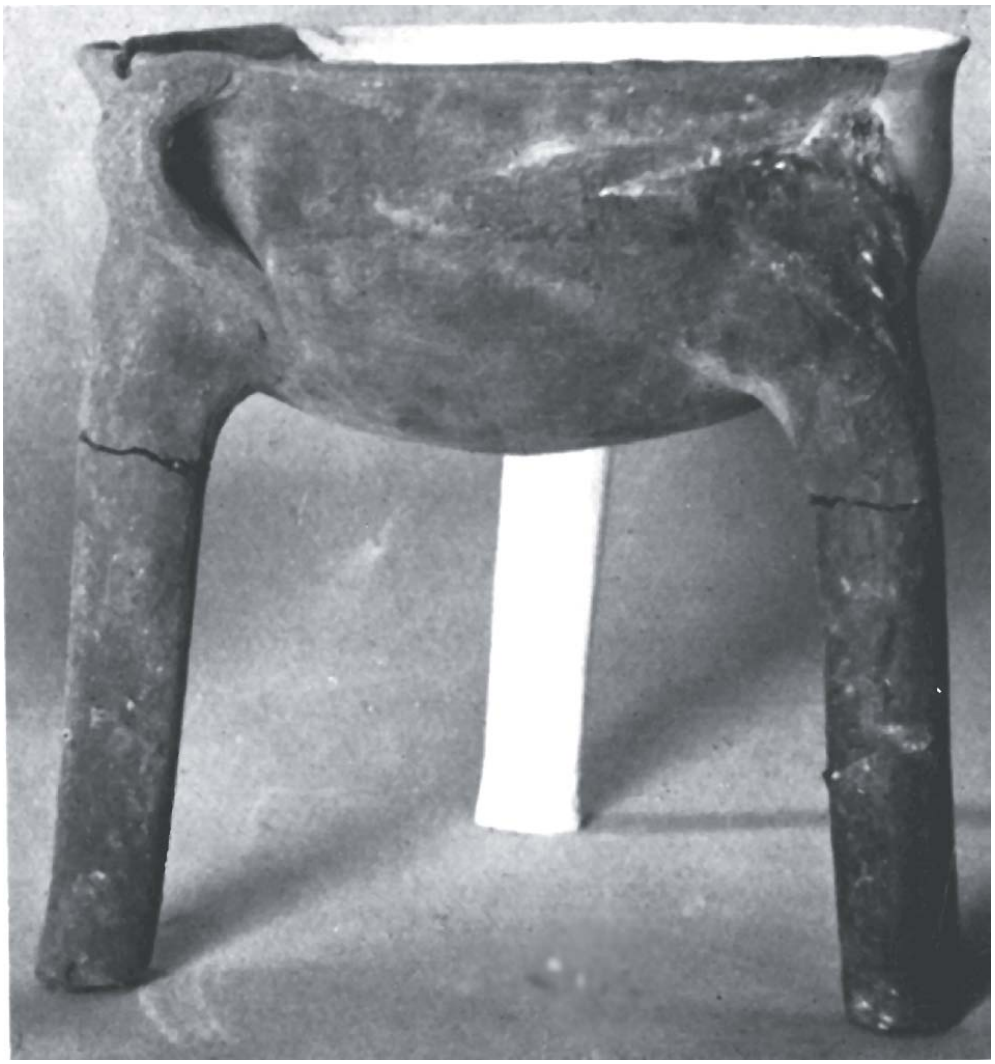


Figure 2.2. Restored tripod cooking vessel from the granary at Mycenae. 0.145m height (Wace et al. *1921/1922–1922 /1923, pl. viii.b). Reproduced with permission of the British School at Athens*

In the 1930s many scholars still devoted only modest portions of text to cooking vessels. There are several exceptions to this trend: Hetty Goldman (1931, Eutresis) and Otto Frödin and Axel Persson (1938, Asine) each publish photographs of Early, Middle, and Late Helladic cooking vessels alongside other ware types, itemizing them and describing their dimensions, surface treatments, and fabrics. In Oscar Broneer's (1933 and 1939) and Hazel Hansen's (1937) reports on excavations at the Athenian Acropolis, each wrote in a manner similar to Blegen's narrative style. Broneer began to create a list of comparative samples and their distribution, noting the characteristics of similarly shaped cooking vessels found around Greece (1933, 371). Additionally, Broneer and Hansen each published photographs of fragments of cooking vessels instead of merely the complete ones (Fig. 2.3). In particular, Hansen's publication included images of tripod legs and described the range of shapes and sizes (Fig. 2.4), acknowledging that these different shapes could be used to date deposits or identify the vessel's origin.

On the whole, however, scholars who published their findings in this early period reflected the general trend where cooking vessels were kept and published only if they were preserved intact or from interesting contexts, such as burials. Scholars also tended to identify cooking pots by their shape *and* fabric, rather than by fabric alone. When fragments were mentioned it was because they were diagnostic, such as tripod legs, which permitted scholars to determine the shape and use of the vessel. Rims and body sherds, on the other hand, were rarely mentioned.

Furumark: a step forward or a setback for cooking vessels?

Furumark's famous classification of Mycenaean ceramic shapes represented a significant advancement in our understanding of the morphological and chronological features of all types of vessels. While he incorporated several examples of cooking vessels in his typology, Furumark's work was strongly oriented toward decorated vessels. This was not necessarily the result of his lack of understanding of cooking vessels. Rather, Furumark was at a distinct disadvantage because he could only make use of those specimens that had been excavated and published before 1941, most of which were fine ware vessels from tombs. As an indication of how restricted his sample size was, Furumark only listed one type of tripod cooking pot with no variation in size, shape, or detail, because only six tripod vessels were available to him at the time. In direct contrast, Furumark categorized over 30 different versions of decorated fine ware kylikes. When Furumark's work was republished in 1972, new excavations such as Berbati, Lefkandi, and Pylos were added to his catalog, but no adjustments were made to his classifications. While Furumark acknowledges the poor sample size, he does not place blame accordingly:

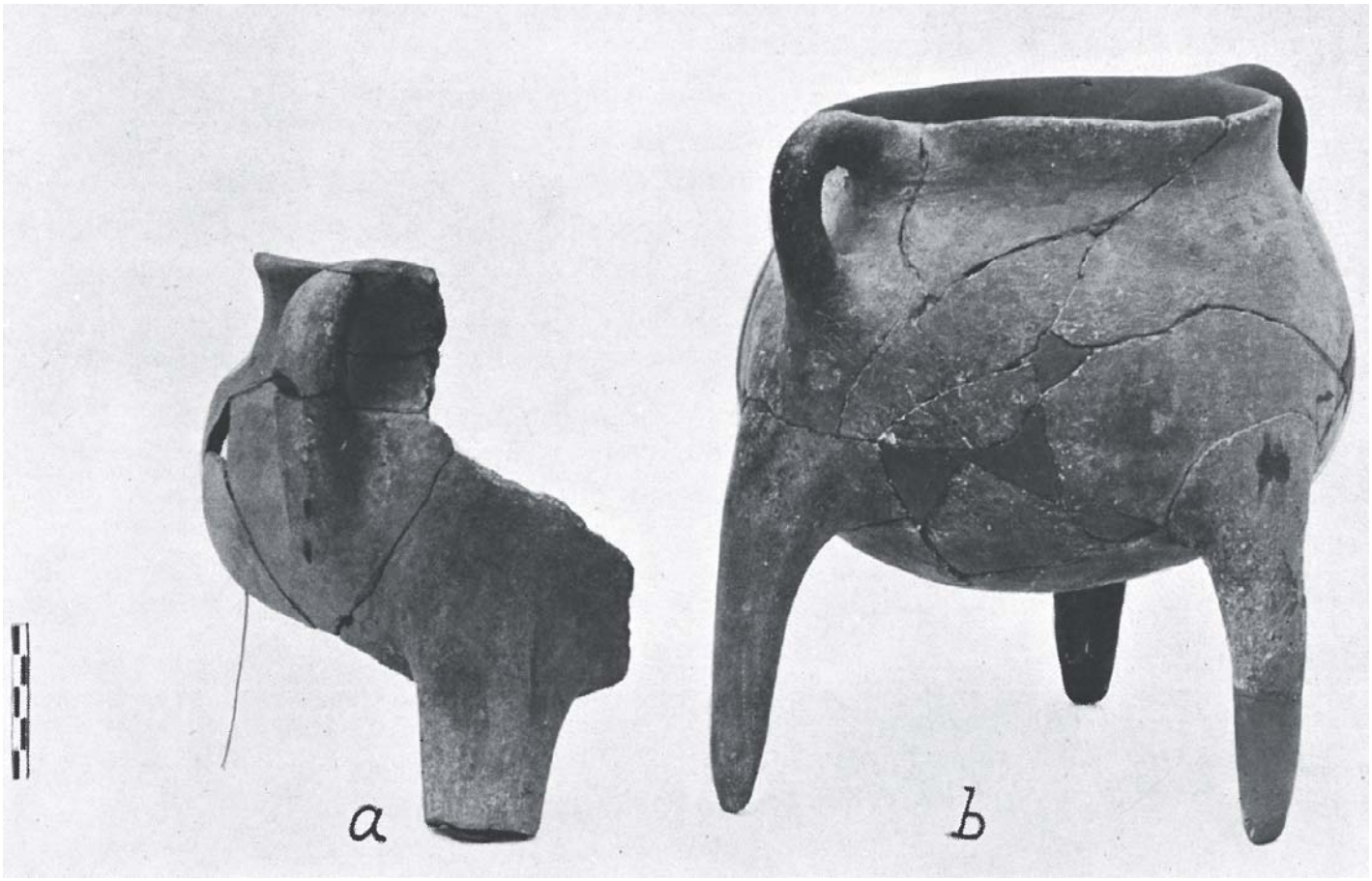


Figure 2.3. LH III tripod cooking vessels from the Mycenaean Fountain on the Athenian Acropolis (Broneer 1939, fig. 81). Courtesy of the American School of Classical Studies at Athens

> It is remarkable that so very few types of Mycenaean household utensils of clay have been found. In this respect the Mainland forms a striking contrast with Crete, where domestic vessels and implements occur in a great number of varieties, in part of a highly specialized nature. (Furumark 1941, 79)

While Furumark's observations on the differences between the morphology of Minoan and Mycenaean cooking vessels are still valid, as proven by recent scholars (*i.e*. Borgna 1997; 2000), his sample size was clearly limited. As discussed earlier, vessels that were published before 1950 tended to come from tombs or large elite structures, were preserved intact, and were often elaborately decorated. For example, a large number of Cretan samples that Furumark cited in his work are whole, decorated braziers found at the Mavro Spelio Cemetery at Knossos (Forsdyke 1926/1927). Cooking vessels, on the other hand, rarely met these criteria. As a result, Furumark's sample size was severely limited because of limited publication records.

Unfortunately for those who study cooking vessels, Furumark's work still impacts our treatment of these artifacts. Single Furumark Shape (FS) numbers are frequently used in descriptions and publications to describe shapes with wide variations, while those shapes that do not have a number receive minimal treatment. As a result, the formation of any typology has been hindered, and the assumption that these vessels are not worthy of study has persisted. Elizabeth French initially drew attention to this situation in her discussion of tripod vessels from Mycenae: "The examples of this shape show various differences from the type as described by Furumark. First, there is a wide range of size; secondly, the handles vary in number; thirdly, the legs are flattened and not round" (1967, 177). Without revisions to his work, we risk accepting the

idea that cooking pots do not evolve morphologically over time or vary in different regions of Greece.

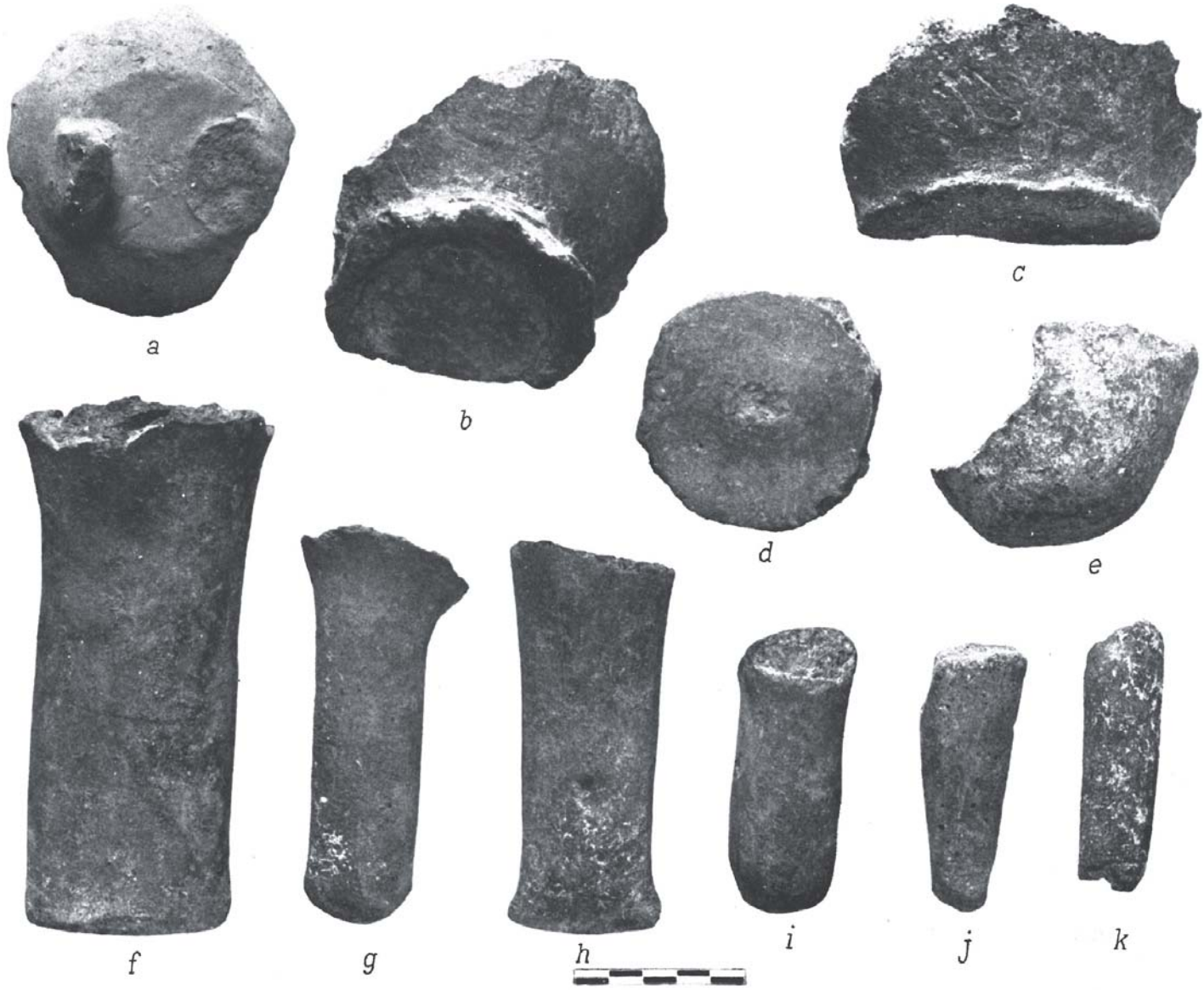


Figure 2.4. LH III cooking vessel sherds, including six tripod feet of varying sizes and shapes (Hansen 1937, fig. 17). Courtesy of the American School of Classical Studies at Athens

1950s to 1970s: the (cooking pot) gap grows

The quality of publications and research methodologies changed by the 1950s thanks in large part to Blegen's team's work at Troy (Blegen *et al*. 1953; 1958) and Pylos (Blegen and Rawson 1966) where the publications briefly describe fabrics (including color and temper) and conduct shape studies of cooking vessels. The work with the ceramics at Pylos almost certainly reflects the input of his collaborator, Marion Rawson (Julie Hruby, personal communication). By the late 1960s and early 1970s, cooking pots were regularly mentioned alongside fine wares in catalogs (*e.g*. Rutter and Rutter 1974), which also became more standardized and formulaic rather than narrative. Many publications (*e.g*. French 1965; Sackett *et al*. 1965; Immerwahr 1971) listed cooking vessels' inventory numbers, FS numbers (if there were any), production dates, measurements, fabric descriptions, and provided distributions. Detailed drawings as well as photographs of whole cooking vessels and their fragments were also commonplace. While earlier publications still resembled Schliemann's

style from 1880 (*e.g*. Stubbings 1947, 54), changes began to emerge in the 1970s. Hartmut Döhl (1973) not only provided fabric descriptions of cooking vessels from Iria, but even identified two types: sandy ware I, the main fabric for LH IIIB rounded-body tripods, and sandy ware II, used primarily for LH IIIC shallow-bodied tripod cooking pots, in addition to other shapes (1973, 186–189). His work, which was one of the first of its kind, demonstrated how we can use fabrics to identify vessel shapes and to date deposits.

Despite these improvements, Aegean prehistorians began to fall farther behind the rest of the world in their attention to cooking vessels. One reason was that ceramics from other parts of the world, such as North America, were primarily used for cooking, while organic items (wooden vessels, baskets, cloth, *etc*.) were used for other needs like storage and transport (Braun 1987, 162). Mediterranean archaeologists, on the other hand, were faced with a wide range of wares, the most appealing (and distracting) of which was fine ware. As a result, North American ceramicists focused on studying cooking vessels through a variety of means, while Greek prehistorians preferred to develop chronologies based on decorative motifs and shapes (Farnsworth 1964, 221).

This leads us to the second reason for the lag in Aegean prehistorians' scholarship: our slow adoption of scientific modes of pottery analysis. In North American archaeology, Anna Shepard's work (1965) was one of the best resources for understanding utilitarian vessels, as she considered different types of production methods and made use of objective methods of study such as petrography, chemical analysis, and x-ray diffraction. As a result, Shepard showed how coarse wares from the American Southwest could move over surprisingly long distances. Archaic and Classical Greek archaeologists also made more progress than prehistorians by using cooking vessels to identify important changes in political and economic spheres. For example, Paul de Paepe conducted a petrographic study on cooking vessels from Thorikos in order to determine their provenance and directly challenged the contemporary assumption that all household pottery is of local origin (1979, 63). Through his study de Paepe concluded that cooking vessels came from non-local areas more frequently than any other domestic ware type because of the specialized function of cooking vessel fabric (1979, 84–86). Unfortunately, prehistorians did not conduct such studies on Bronze Age cooking vessels at this time or did so as minor additions to other studies. Rather, most studies focused on fine wares. D. F. Williams's petrographic study on materials from Thera considered a range of ware types, but "due to the nature of the sherds it is not possible to indicate the type of vessels represented, though given their coarse nature these may well have been cooking vessels or containers" (1979, 33). The lack of attention to specific coarse ware fabrics and the failure to sample known vessel types and shapes resulted in a situation where all coarse wares were treated together, if they were considered at all.

1980s and '90s: restoring the record of cooking vessels

Fortunately, cooking vessels received increased attention throughout the 1980s. An influx of excavation reports, catalogs, and individual typologies appeared, most of which included cooking vessels together with other wares, as well as drawings, photographs, and distributions of comparative samples. Cooking vessels can be found within the articles, dissertations, and excavation reports from Asine (Frizell 1980), Athens (Mountjoy 1981; 1995), Lerna (Zerner 1986; 1988; Rutter 1995), Mycenae (Shear 1987), Nichoria (McDonald and Wilkie 1992), Tsoungiza (Wright 1982; Rutter 1989; Thomas 1992), and Zygouries (Thomas 1992). Notable among these was Jeremy Rutter's work, which included extremely detailed descriptions of cooking vessels. Equally insightful and progressive were the works of Philip Betancourt (1980) and Elisabetta Borgna (1997). Betancourt was one of the first scholars to publish a study that concentrated entirely on cooking vessels, specifically those from Minoan Kommos. Although it was brief and summarized information from annual excavation reports, he created his own typology of shapes and provided a list of descriptions, with notes on fabric features and textures (Fig. 2.5). His research on these cooking vessels was then added to

a larger volume on Minoan pottery (Betancourt 1985). Borgna's publications represented the earliest clear uses of Bronze Age cooking vessels as reflections of social habits. By examining tripod vessels, Borgna identified different food preparation techniques and the locations where cooking took place, leading her to distinguish between Mycenaean and Minoan uses of food in daily life and ritual events (1997; 2000).

Additionally, hypotheses on functions of cooking vessels also appeared at this time. Patrick Thomas (1992) argued that the large deposit of cooking vessels at the "Potter's Shop" at Zygouries represented an assemblage for the perfumed oil industry. Harriet Lewis (1983) included the manufacture of cooking pots in her general study of Mycenaean ceramic production, noting the importance of thermal properties and comparing Mycenaean vessels to those from ethnographic studies. These efforts were important steps toward recognizing the archaeological value of cooking vessels and studies that made use of them.

On the whole, Bronze Age archaeologists in the 1980s and 90s no longer ignored cooking vessels. Typically, these vessels were discussed with vessels made with different fabrics, especially in morphological studies (Hallager and Hallager 1997; Dalinghaus 1998). One of the best examples of the incorporation of cooking vessels into studies on other wares is John Riley's petrographic study (1981) of fine, coarse, and cooking wares from Bronze Age and Roman Mediterranean sites. By examining the relationship between ceramic production and ancient economies, Riley was able to conclude that "coarse, domestic pottery can have a wider distribution than merely local, and in some cases, to areas perfectly capable of producing similar pottery" (1981, 140). He was also able to trace the origin of one cooking fabric to the island of Aegina, a fabric that was becoming more widely studied (*e.g*. Maran 1992a). Unfortunately, studies like these were not common during these decades and rarely focused on cooking vessels alone.

In other parts of the ancient world and time periods, on the other hand, cooking pots were subjected to a much wider range of studies. The field of experimental archaeology was especially useful for identifying characteristics that make cooking pots so efficient and durable. For example, Gordon Bronitsky and Robert Hamer (1986) produced ceramic briquettes with different types of temper to see how this component affected thermal shock. Naturally, cooking vessels were also frequently used to recreate ancient diets. Louise Joyner (1997) examined shapes and petrographic fabrics of Byzantine and Frankish cooking vessels to determine if specific cooking styles or ingredients were indicative of certain vessel shapes. Her findings revealed that conservative changes in the morphology of cooking vessels mirrored the changes in the site's occupation and the population's demographics. Finally, Monique Vilder's examination of Iron Age Jordanian cooking pots (1993) showed how a full understanding of production methods is useful for identifying long-term production facilities. Her study included an examination of raw materials, vessel formation techniques, and firing environments. Each of these publications contained answers to questions that Aegean prehistorians only regularly began to consider in the following decade.

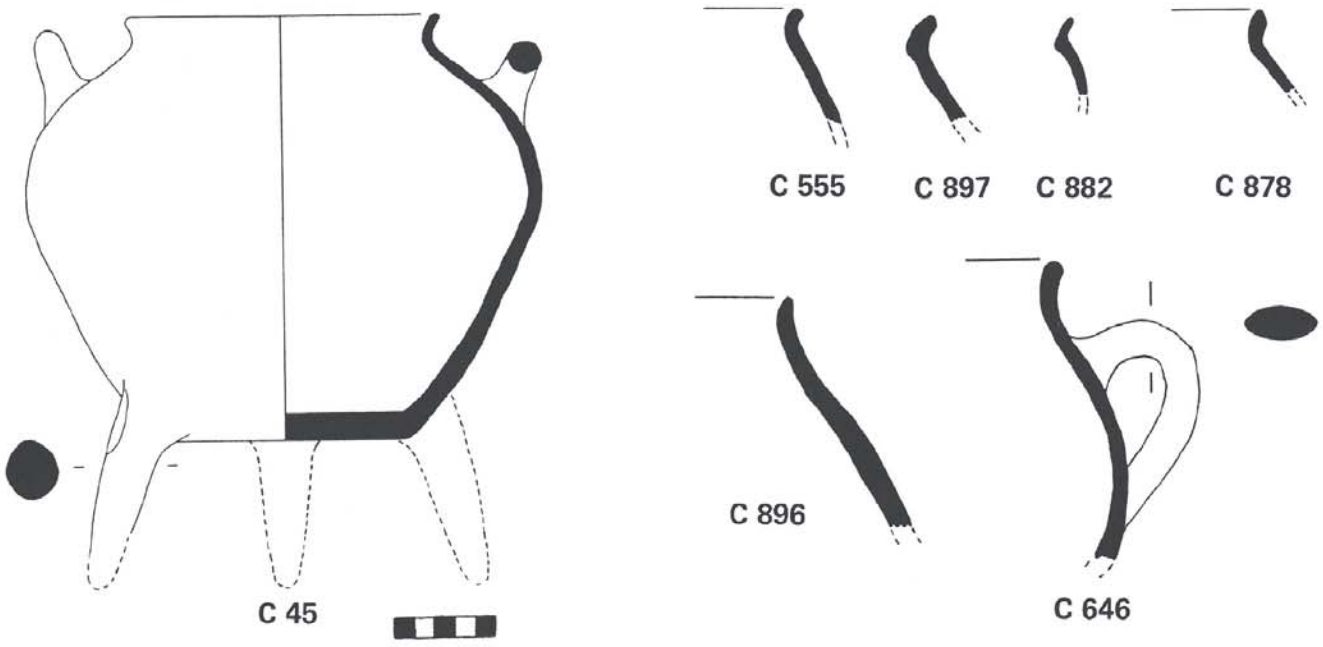
2000s: a feast of information for Aegean prehistorians

The beginning of the current millennium represented the first extensive effort by Bronze Age Aegean archaeologists to actively use cooking pots as a primary source of information, as opposed to studying or listing them alongside other wares. Even excavation reports that presented cooking ware and fine ware together contained significant amounts of information on cooking pots, such as Hector Catling's volume on the Menelaion (2009) that included documentation and drawings of over 350 cooking ware sherds and vessels. Further examples of shape studies include Birgitta Hallager's (2000; 2003; 2011) work on the LM III vessels from Khania, which incorporated narratives on the dimensions and forms of cooking pots. Significant attention was (and continues to be) paid to a single cooking fabric type: the Aeginetan cooking ware. Michael Lindblom (2001; 2007) devoted significant portions of his analysis of manufacturers' marks to cooking vessels from the island, noting the distribution of the marks throughout Greece and the inclusions unique to

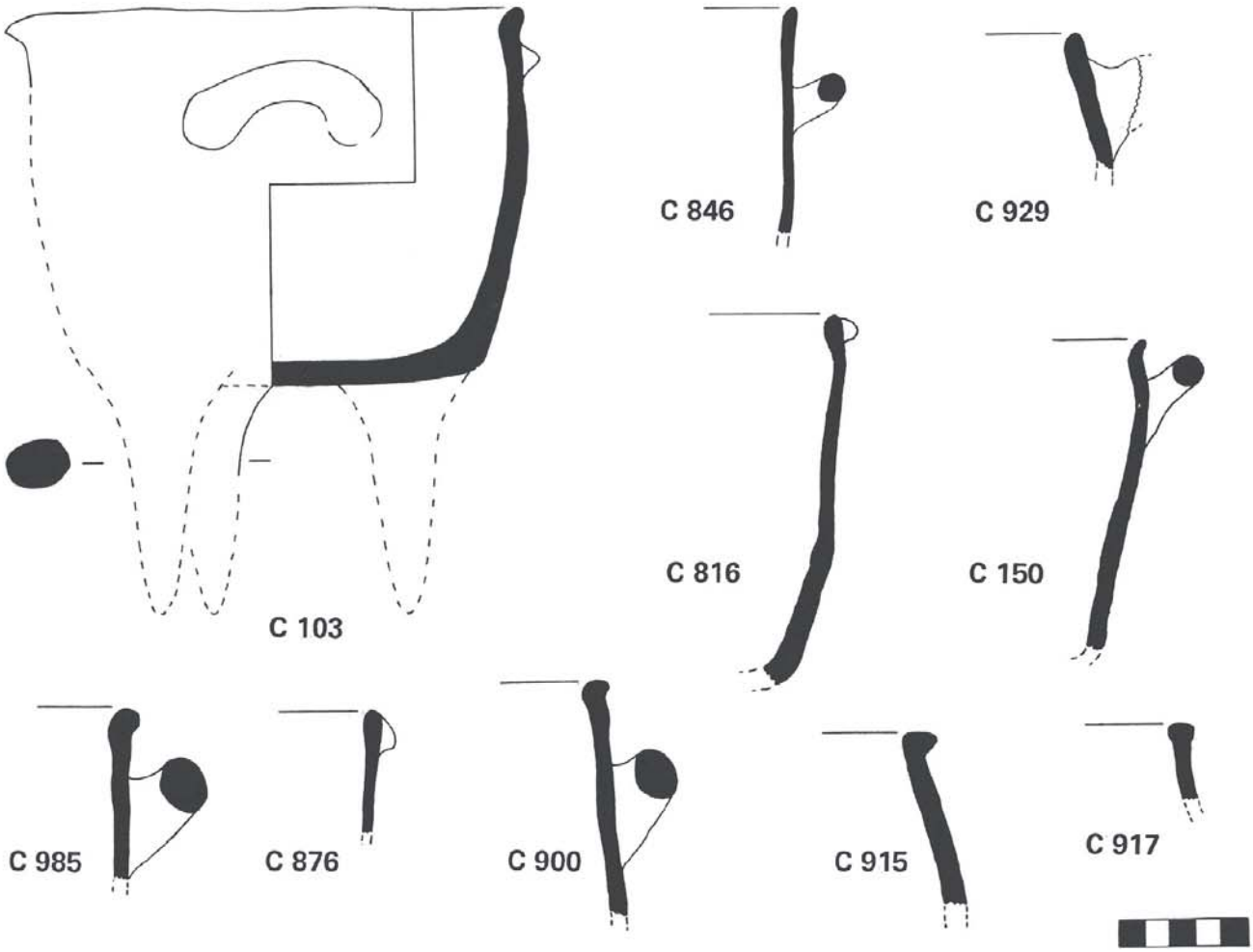
this fabric.

Articles focusing solely on cooking vessels became more common, such as Gilles Touchais's analysis of coarse ware vessels from Argos (2007). One of the most significant steps forward was Michael Baumann's report on LH coarse wares printed within the excavation reports on Midea (2007). Like Döhl in an earlier decade, Baumann identified at least five local and one imported cooking ware fabrics, but he also supplied a description of shapes and established a clear terminology. Such a study was not duplicated until Bartłomiej Lis's work on Tsoungiza (in press) and my own dissertation (2016) on various sites in the Argolid and Corinthia.

At this point, Aegean archaeologists began to eagerly pursue concepts of identity and political change in antiquity, which resulted in a large number of publications concerned with feasting, ceramics used during these events, and their cultural and political significance. Unfortunately, for those studying cooking pots, the majority of these studies still focused on fine ware drinking vessels. Only a few scholars investigated the role of cooking vessels in this context, such as Wright's edited volume *The Mycenaean Feast* (2004a). Other publications made equal use of cooking and fine ware vessels at feasts, including Rutter's work on vessels from Kommos (2004) and Borgna's (2004b) study of "haute cuisine" and conspicuous consumption in Minoan culture. Those studies that only looked at cooking vessels within the context of communal feasting and political or religious events were still rare. For example, Lis (2006; 2008) examined cooking jars, braziers, and other cooking vessels found within feasting deposits from Tsoungiza, Lerna, and Pylos to understand the role of food and its preparation for Mycenaean feasts. Julie Hruby (2006; 2008) also considered the use of specialized cooking vessels, specifically the griddle and souvlaki tray, to identify the palatial elite's effect on diet in the Late Bronze Age.



A. Type A Cooking Pots



B. Type B Cooking Pots

Figure 2.5. Type A and B cooking vessels from Kommos as cataloged by Betancourt (1980, fig. 1). Courtesy of the Cotsen

Additional publications emerged during this decade that subjected cooking vessels to a wider range of scientific analyses and other approaches, rivaling contemporary studies from other parts of the world. Yanni Tzedakis and Holley Martlew's publication (2008) of the materials from a museum exhibition attempted to reconstruct Bronze Age cuisine, focusing on evidence from organic residue analysis. Furthermore, in an edited volume by Christopher Mee and Josette Renard (2007), several scholars conducted studies that made use of lipid and residue analysis (Roumpou *et al*.), production and use studies (Sophronidou and Tsirtsoni), morphological approaches (Urem-Kotsou and Kotsakis), and comparative analysis with faunal remains (Isaakidou) to identify the relationship between ceramics and food. While these chapters were limited to vessels from Neolithic and Early Bronze Age Greece, their interpretations of the role of cooking vessels during food preparation and consumption are relevant to the Late Bronze Age as well.

There was also a surge in publications and research on the physical and mechanical properties of cooking vessels. Noémi Müller in particular made great strides in her dissertation on vessels from Thera (2008). In subsequent publications with Anno Hein, Vassilis Kilikoglou, Peter Day, and others she actively investigated the thermal conductivity of cooking fabrics, the usefulness of types of temper and the functionality of low firing temperatures in order to identify the complicated relationship among raw materials, manufacturing processes, and firing temperatures (Hein *et al*. 2009; Müller *et al*. 2010; 2013; 2014). This increased quantity and quality of publications on Bronze Age Aegean cooking vessels demonstrated how prehistorians quickly began to catch up with those in other fields.

2010 and beyond: out of the frying pan …

The current decade has seen a continuous output of high-quality studies on Bronze Age cooking vessels, a trend that began in the previous decade. Lis (2010a) brought scholarly attention to the limited treatment of cooking vessels and called for a new methodology based on his analysis of sherds from Mitrou. Additionally, scholars continue to publish large volumes devoted entirely to cooking pots, producing typologies of these vessels at an impressive rate. These include Reinhart Jung's publication on Late Cypriot ceramics from Enkomi (2011a), Fredrica Spagnoli's manuscript on Bronze and Iron Age Levantine vessels (2010), Maria Alberti's works on cooking vessels from Neopalatial Crete (2011; 2012), and Lis's chapter on cooking shapes and fabrics from Tsoungiza (in press). Aeginetan cooking vessels still receive considerable attention, thanks in part to Lis's diligent work (2012a), as well as the contribution to this volume by Gauss *et al*. (Chapter 6). Ph.D. dissertations devoted solely to cooking vessels are also more frequent, such as Lis's work on cooking vessels from Mitrou and Tsoungiza (2012b) and my own work on sites in the Argolid and Corinthia (Trusty 2016).

The most fruitful of the current efforts have been found in published conference proceedings, such as the British Museum's 2010 symposium that focused solely on cooking vessels from a wide range of European sites over the entire span of antiquity. The publication featured articles on the production, use, and consumption of cooking vessels and included a variety of petrographic, chemical, morphological, and experimental techniques (Spataro and Villing 2015). There are many articles of particular interest to Aegean prehistorians within this volume; these include works by Ian Whitbread on cooking vessels from Berbati, Müller *et al*. on vessels from Akrotiri, the contribution of Gauss *et al*. on Aeginetan cooking ware, Lis on the limits of analyzing cooking vessels, and Morrison *et al*. on reconstructing Minoan vessels.

Additionally, Vassos Karageorghis and Ourania Kouka (2011) have published the proceedings of their own symposium dedicated to Bronze Age utilitarian ceramic artifacts, including cooking and drinking

vessels, as well as loomweights, from Cyprus and the surrounding areas. Many articles within this volume addressed topics of identity, cuisine, and daily life and make important observations on the relationship between Near Eastern and Mycenaean cultures. For example, Badre provided a detailed description of cooking pots from Tell Kazel in Syria and identified changes in culinary traditions that occurred as a result of interactions between Mycenaean and Syrian traders and elites. Jung (2011a) also contributed to ideas of food and cooking methods with his piece on Cypriot vessels, showing how changes in technology (from handmade to wheel-thrown vessels) were synchronous throughout the island, a testament to the importance of understanding chronological changes of cooking vessel shapes and forming techniques.

Experimental archaeology continues to be an invaluable source of information. Scholars have worked diligently to reconstruct prehistoric Aegean cooking vessels and fabrics and then test their ability to prepare ancient recipes in order to understand cooking and heating techniques. These include the use of local clays from Crete by Jennifer Moody *et al*. (2012) and Jerolyn Morrison's (2011) and Hruby's (Chapter 4) reconstructions of cooking vessels based on Minoan and Mycenaean shapes, respectively. In Roman studies, Laura Banducci (2014) has categorized the blackening patterns that result from different types of heating sources on different parts of cooking vessels by conducting her own tests on modern vessels. Such studies are important for our understanding of the technological choices that prehistoric potters made and the potential uses such vessels had.

… And out of the fire: lessons learned

In the past decade, scholars have seriously addressed the lacuna that exists in cooking vessel scholarship using new and innovative studies. Of course there is still much work to be done. The range of shapes and sizes of tripod cooking vessels discussed throughout this chapter demonstrates how great of a need there is for a large-scale morphological study. After comparing the methodologies of Aegean Bronze Age archaeologists with those from other parts of the world, it seems that the former are typically ten to forty years behind the latter at any given time. While many scholars previously assumed that the morphological features of ancient cooking pots trail behind contemporary fine ware shapes, it turns out that our methods for studying these vessels are actually what lag. Nevertheless, with improved excavation techniques, advances in scientific tests and methodologies, and the increased quantity and quality of publications on domestic sites, the future of the study of Aegean Bronze Age cooking vessels is extremely promising. Perhaps most exciting of all, however, is the growing acknowledgment that Mycenaean and Minoan cooking vessels are specialized tools, worthy of preservation and study.

Note

1 I would like to thank my co-editor, Julie Hruby, for her collaboration on the AIA conference panel and for her diligence in producing this volume with me. Furthermore, I would like to express my sincere appreciation to Cynthia Shelmerdine, Joann Gulizio, Bartłomiej Lis, Jeremy Rutter, and Daniel Pullen for their helpful comments.

3

Finding haute cuisine: Identifying shifts in food styles from cooking vessels

Julie Hruby

Introduction[1]

While such great theorists such as Veblen (1994, originally 1899) and Bourdieu (1984) have discussed the mechanisms through which conspicuous consumption works and the relationship between taste and social class, we still lack an adequate understanding of when and how taste initially emerges as a social force. This paper attempts to make a few small inroads into this admittedly gigantic topic. As the author has argued in the past (Hruby 2006; 2008), cuisine is a particularly effective means of conspicuous consumption, and Mycenaean elites used culinary choices as a mechanism for reinforcing class distinction. In brief, the argument is that generally when such cuisine emerges in cultures, it is used as a form of conspicuous consumption (Goody 1982, 96; Mennell 1985, 102–133; Hruby 2008, 152), and a variety of factors indicative of class-differentiated cuisine may be detected archaeologically and textually. These include a wide range of available foodstuffs (Hruby 2006, 287–297), active attempts to increase the range of available foodstuffs, a range of culinary technologies, attested by the range of cooking vessels, and specialized culinary personnel (Hruby 2008, 152–155).

When, then, did this cuisine develop? Presumably, such a question might be addressed with many of the same kinds of evidence used to establish the existence of elite cuisine: dating the introduction of new species, textual data for the naming of culinary professions, and the presence of a suite of specialized cooking and serving wares. Unfortunately, the evidence for dating the introduction of new species and the textual data remain thin, though conceivably future pollen cores and discoveries of tablets could add depth. The most promising evidence for the existence of elite cuisine, then, are changes in the popularity of highly specialized cooking ware types, reflecting a shift in cooking styles. There are many of these, of which I examine only a few here. While much prior scholarship has focused on the Shaft Grave Period as a major social transition point, at which wine-based feasting supported emerging social hierarchies (*e.g.* Wright 1995, 294–295), it is

beginning to look as if another wave of culinary innovation may have emerged during the LH III period.

The basic range of Mainland cooking equipment seems to have remained fairly consistent from the Middle Helladic period through the Early Iron Age, notable only for the introduction of the tripod cooking pot in the Middle Helladic period (Furumark 1972, 76; Dickinson *et al*. 1992, 480). Most forms are rounded (Kanta 2003, 177), in shapes that would have been used primarily for boiling, simmering, or stewing over an open hearth. However, a wider range of culinary techniques is reflected in the archaeological record through idiosyncratic cooking pot forms in the Late Helladic III period. Griddles and souvlaki trays are among the relevant forms, probably reflecting more efficient frying and spit-roasting activities (*cf*. Fox 2012, 128–129). While the earliest securely datable examples of each type date to the LH III period, there are a limited number of examples of each currently known, and it is not impossible that future research may shift the date of this transition somewhat earlier.

Griddles

"Griddles" are large (*ca*. 0.35m in diameter) clay disks with indentations on the surface of one side; these indentations are usually narrow and deep, but they rarely can be broader, shallower indentations made with a fingertip. The vessel type seems to come in at least three different shapes. Some have short walls all the way around (Fig. 3.1, hereafter called "handleless griddles"), some have much taller walls part of the way around with exterior handles (Fig. 3.2, hereafter called "horizontal-handled griddles"),[2] and some appear to have three feet (Fig. 3.3, hereafter called "tripod griddles"). It is not clear whether all three shapes were used in identical ways.

In order to identify conclusively of which type a griddle was, it may be necessary to have nearly a third of the rim diameter preserved. The reason for this is fairly simple. While a horizontal-handled shape should be easily identifiable, so long as enough of the wall is preserved to reflect either its height or a perforation in the sidewall, differentiating the tripod shape from the handleless one is more challenging. A short wall is characteristic of both types, so a sherd that one might be tempted to identify as a handleless shape could actually represent a tripod shape.

In the past, the griddle shapes have been given multiple appellations, and there seems to be no particular pattern to which artifact is called what. Oscar Broneer refers to a fragment that might have been any of the griddle shapes as a "coarse strainer" (1939, 400), which it clearly cannot have been. Mylonas calls an un-illustrated example a "portable hearth" (1975, 106), and Strack identifies all types as "portable hearths" (2007, 210). Lis refers to the tripod griddles as "portable hearths" (2008, 147). French calls what is probably a handleless griddle a "brazier or cooking dish" (1969, 85, 91), and Cavanagh *et al*. call a similar fragment a "brazier" (1996, 22, fig. 12.4). Catling calls all three types "chafing dishes" (2009, 430). Mountjoy refers, inaccurately, to a sherd that could represent any of the three types as a "souvlaki dish" (2008, 314). Dawkins calls a horizontal-handled griddle a "bread-pan" (1902, 325), and the Hallagers call the horizontal-handled examples "bread ovens" (Hallager and Hallager 2003, 244, pl. 77; 2011, 356–357, pls 140, 203a); Borgna and French call the same shape an "oven" (Borgna 1997, 195, 197; French 2002, 112). Some scholars describe a member of these forms as a *"tragherd"* or portable oven (Kilian 1979, 400 for a handleless griddle; Hiesel 1982, 438–439 for a tripod griddle; Kilian 2007, 28 for a tripod griddle). Hofstra describes the horizontal-handled version as a "parching tray" (2000, 63). Schliemann refers to the handleless griddle as a "pan" (1976, 116), and Dalinghaus refers to griddles generically as "baking pan with perforations," the most complete example of which is presumably a handleless one (1998, 136–137); Baumann refers to both the horizontal-handled griddle and what may be sherds from either the handleless griddle or the tripod griddle as coming from a "baking pan" shape (2007, 161). Iakovidis refers to what might be a handleless shape as a "broiling pan" (2001, 109). Many authors refer to one or more of the shapes as a "grill," including Shear 1987, 112;

Ιακωβίδης 1989, 171, 234; Lis 2008, 147, and Lis in the current volume). French calls the handleless variety and the horizontal-handled variety "griddles" (2002, 112), while Blegen and Rawson also call the horizontal-handled version a "griddle" (1966, 340). Gulizio and Shelmerdine (this volume) and I have called all three forms "griddles" (2006, 139–142; 2008).

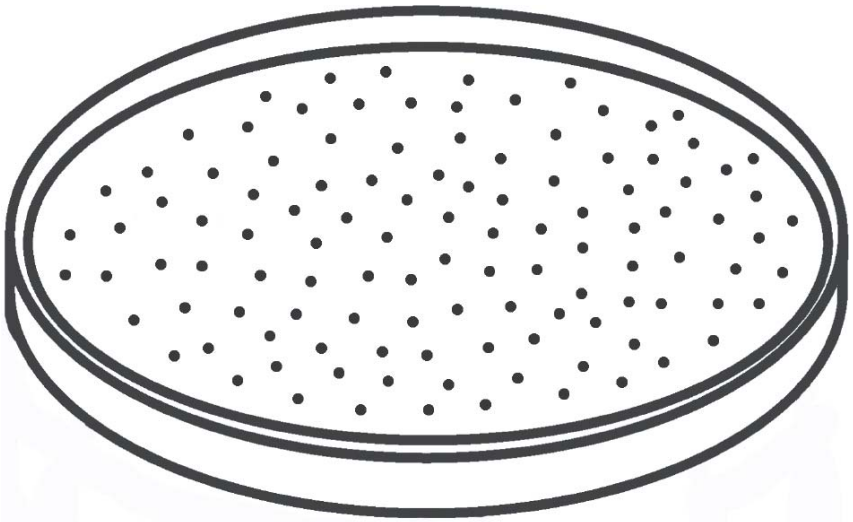


Figure 3.1. Diagram of low-walled griddle, by the author

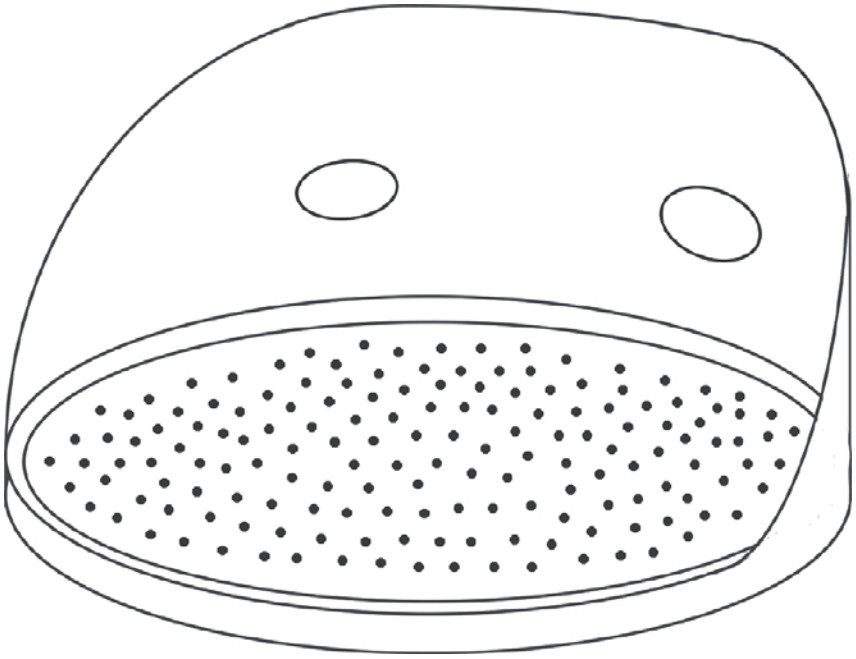


Figure 3.2. Diagram of high-walled griddle, by the author

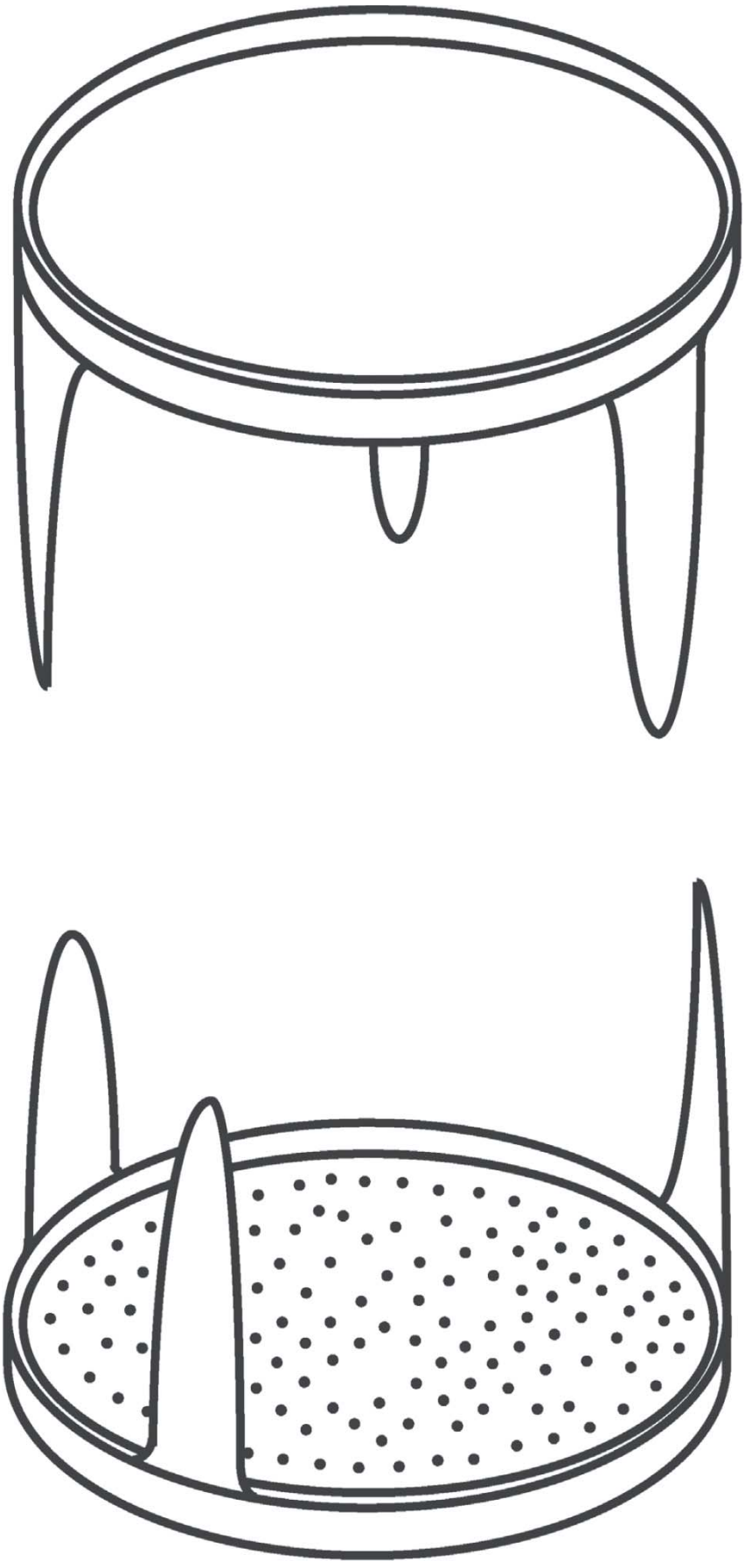


Figure 3.3. Diagram of tripod-shaped griddle, by the author

In order to treat these as evidence for elite cuisine, it is necessary to demonstrate two things: that they come from elite contexts, and that at least some of these vessels were frequently used for cooking, rather than all members of the type having been used as braziers or hearths. In terms of contexts, many do come from in or near what were probably or certainly palaces, such as those found at Athens (Broneer 1939, 400–401), Mycenae (French 1969, 85–86; Μυλωνάς 1975, 107; French 2002, 111–112), Pylos (Blegen and Rawson 1966, 91, 267, 273, 275), and Tiryns (Schliemann 1976, 116; Kilian 1979, 400; Hiesel 1982, 438–439). Others come from elite or mixed contexts at sites that were also palatial or otherwise high on the settlement hierarchy, such as Ayios Stephanos (Mountjoy 2008, 314), Khania (Hallager and Hallager 2003, 244; 2011, 356–357), Gla (Iakovidis 2001, 109), Iklaina (Gulizio and Shelmerdine, this volume), Midea (Dalinghaus 1998, 136–137; Baumann 2007, 161), Mitrou (Lis, this volume), Mycenae (Shear 1987, 112), Palaikastro (Dawkins 1902, 325), Phaistos (at a point after the palace went out of use; Borgna 1997, 195, 197 and this volume), the Spartan Menelaion (Cavanagh *et al*. 1996, fig. 12.4.2; Catling 2009, 430), and Tsoungiza (Thomas 2005, 524–525).

There is substantial circumstantial and a little direct evidence that these vessels were used for cooking. First, one of the low-walled Midea examples was tested by Tzedakis and Martlew for residues (see Fig. 3.7); they reported that they had found evidence of olive oil and of grain, though they unfortunately did not report the data behind the conclusion for this vessel (1999, 126; Tzedakis, Martlew and Jones 2008). Comparable vessels from Cyprus also preserve food residues (Ταραμίδης 1999, 58). Second, as discussed below, the Midea burn patterns seem to reflect cooking. Third, griddles tend to be found in contexts with other cooking vessels. For example, at Pylos they were found in rooms 76, 77, 97, 102, 103, and 105, alongside vessels like spit-supports, cooking pots, and cooking jars (Blegen and Rawson 1966, 273, 274, 312, 332, 340).

The question of use for food is also, in part, a question of orientation; those who orient the vessels with indentations up tend to see them as cooking vessels, while those who orient them with the indentations down often describe them as braziers in order to account for the intense burning visible on the smooth side. My first hypothesis was that the griddle would have been more effectively used with the indented or nearly-perforated side oriented upwards rather than downwards; while some examples have been published with indentations up,[3] some others have been published with indentations down,[4] and occasionally scholars have suggested that the vessels must have been oriented such that the indentations faced downwards (Hansen 1937, 566; Strack 2007, 210-211; Catling 2009, 430).

The argument for the indentations facing down, made independently by Catling (2007, 211) and Strack (2009, 430), is that a tripod-shaped example from Tiryns (for which see Fig. 3.4), when set on its feet, has the indentations facing downward. Catling acknowledges that this unexpectedly puts the burned side up, but he suggests that the problem could be resolved in one of two ways: either that people in antiquity cooked by spreading charcoal over the tray to heat it, then swept the charcoal off and used the heat of the tray, or that the appearance of more burning on the smooth side is a reflection of the foodstuff being heated from the perforated side beneath – though how he envisions this working, in the case of the tripod griddles, is unclear (2009, 430).

Figure 3.4. Griddle from Tiryns, in the Nauplio museum. Photo by the author; used with the permission of the Hellenic Ministry of Sport and Culture

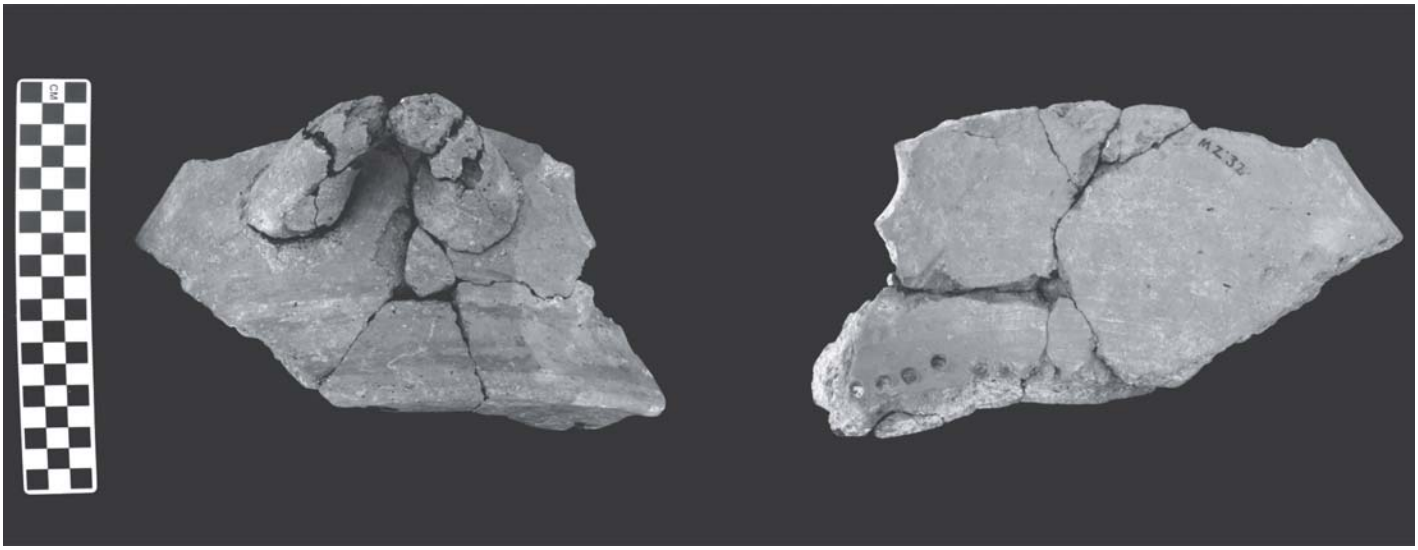


Figure 3.5. Griddle from Pylos. Photo by the author

Strack also suggests that later, in the 7th century, large flat dishes were replaced by lamps, implying that the large flat dishes, and hence the earlier indented ones, were used for lighting (2007, 211). The last argument can, I think, be dismissed, on the grounds that the later flat dishes were not impressed (see, *e.g.* Wells 1983, 87 for Asine and Gros 2006, 991 for Skala Oropou); the indentations introduce a substantial negative variable in performance by creating a weak point where breakage tends to occur (see Fig. 3.6). This suggests that they must have been placed intentionally, for some purpose. The idea that unindented tripods and indented ones potentially served different purposes is, therefore, unproblematic.

However, it is clear that the Pylos examples must have had their perforations oriented upwards, for three reasons. First, one Pylos example has a partially preserved wall, and the orientation of the horizontal handle makes it clear that the perforations must go up (Fig. 3.5). The same is true of the example from Palaikastro (Dawkins 1902, 325). Second, the Pylos examples all have substantial wear from abrasion on the foot, *i.e.*, the part protruding on the side opposite the indentations, and this wear is fairly consistent around the vessels, suggesting that it represents the resting surface (Fig. 3.6). Third, the wall shape does not suggest the flat topped (or bottomed) edge shown in many reconstruction drawings (see, *e.g.* Dawkins 1902, 325 or French 2002, 112), and, if placed on the top of this wall, the griddle would have toppled over (Fig. 3.5; arrows point to finished edges).

Another hint that the indented side was the one used is provided by an example from Midea (Fig. 3.7), on which the entire flat side and part of the indented side show blackened traces of burning. On the flat side, the area is consistently sooted; on the indented side, only the central area is unsooted, and that in a rounded shape, while the margins are heavily carbonized. An analogy would be the pattern that is formed when cookies are baked on a greased cookie sheet in the oven today: where the cookies protect the pan there is no mark, but the grease tends to burn where there are no cookies. This pattern matches closely that described by Skibo for the interiors of cooking pots, where a ring of carbonized material appears around the interior at the level of the margin of the food cooked there (2013, 85, 96–99), with no mark below that point. While charcoal or wood embers do not tend to produce lasting soot at the point of contact unless there are food residues present or temperatures are consistently low (Skibo 2013, 87, 93), the clearly delineated pattern we saw on the Midea griddle's indented surface was dramatically different from that on the bottom of an experimental griddle that was used indented-side down (Fig. 3.8; see below for procedure), where the margins between sooted and unsooted areas were gradual and indistinct. This suggests that, contrary to what one might expect, the Midea griddle's unburned circle reflects not the location of fuel but the location of a cooler or protected part of the surface.

It would be surprising, though by no means impossible, for Pylos and Midea griddle indentations to face upwards, but Tiryns griddle indentations to face downwards. Deep recesses make these vessels much more vulnerable; indeed, breaks in griddles seem typically to follow paths from indentation to indentation,[5] so presumably they exist to meet a very specific need. One possibility is that, much like some Cypriot examples, the Tiryns tripod griddle did indeed have its punctuated surface facing downwards, where the indentations would make it possible for it to heat and cool more rapidly (Ταραμίδης 1999, 61). However, unlike the Cypriot examples (*e.g.* Ταραμίδης 1999, 65), the Tiryns tripod has soot reaching not just to its margins but actually up around them, which suggests another potential solution (Fig. 3.4). It would be possible to take the Tiryns tripod and turn it upside-down; what we have called feet might actually be handles that allowed the cook to keep his or her hands far from the coals, yet narrow enough to avoid impeding access to the griddle surface. In order to evaluate how this particular griddle was used, I inspected it at the Nauplio Museum, postulating that if it was indeed a tripod, there should be substantial wear visible at the distal ends of the feet and relatively less wear at the rim, but that if it had been used perforation-side up, there should be substantial wear visible at the circular base, with relatively less wear visible at the distal ends of the handles. There was substantial wear at the circular base and apparently less at the distal end of the one surviving foot (Figs 3.9,

3.10), but the evidence is not completely conclusive, and it is plausible that the worn base may result from tools placed there rather than abrasion from a hearth.

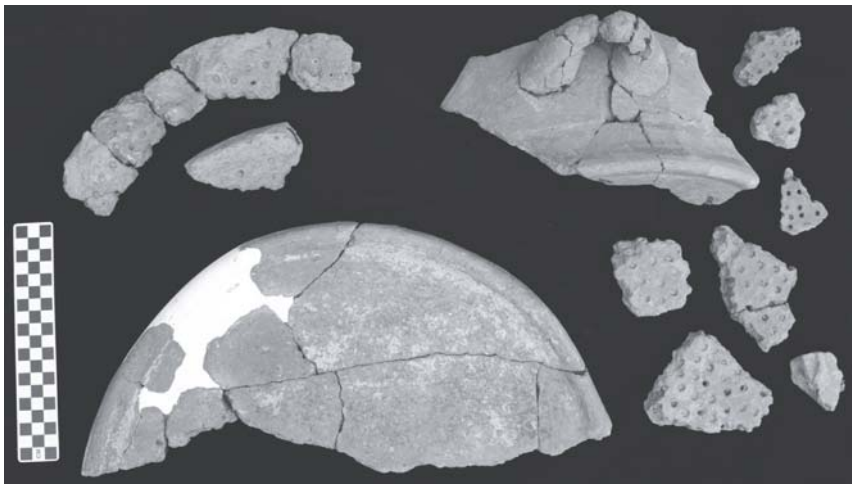


Figure 3.6. Griddles from Pylos. Photo by the author

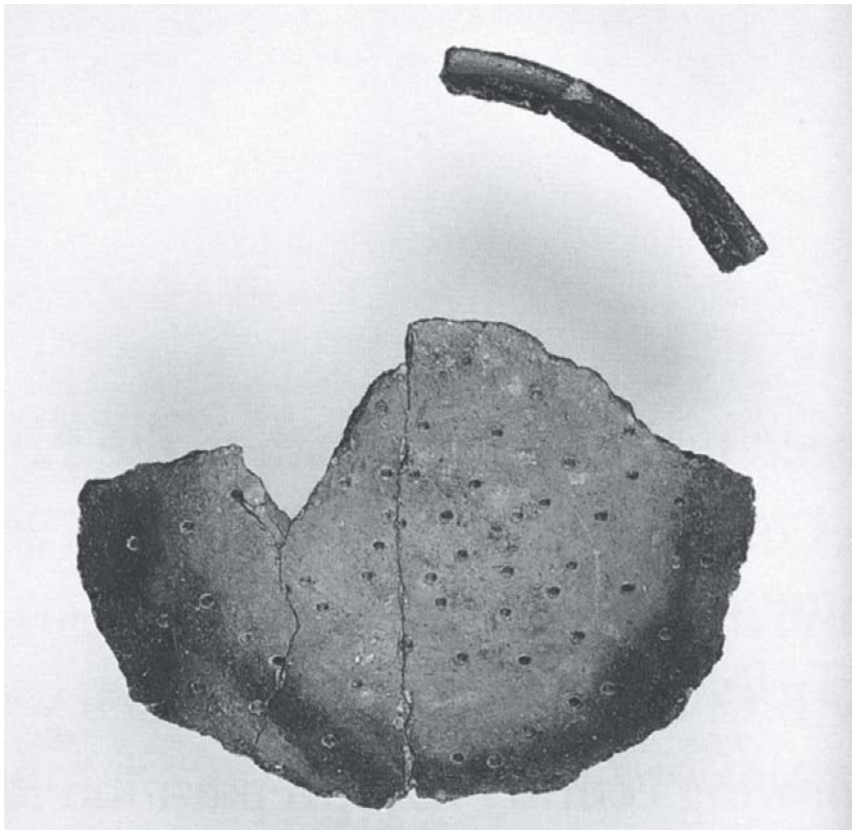


Figure 3.7. Griddle from Midea. Photo used courtesy of Gisela Walberg

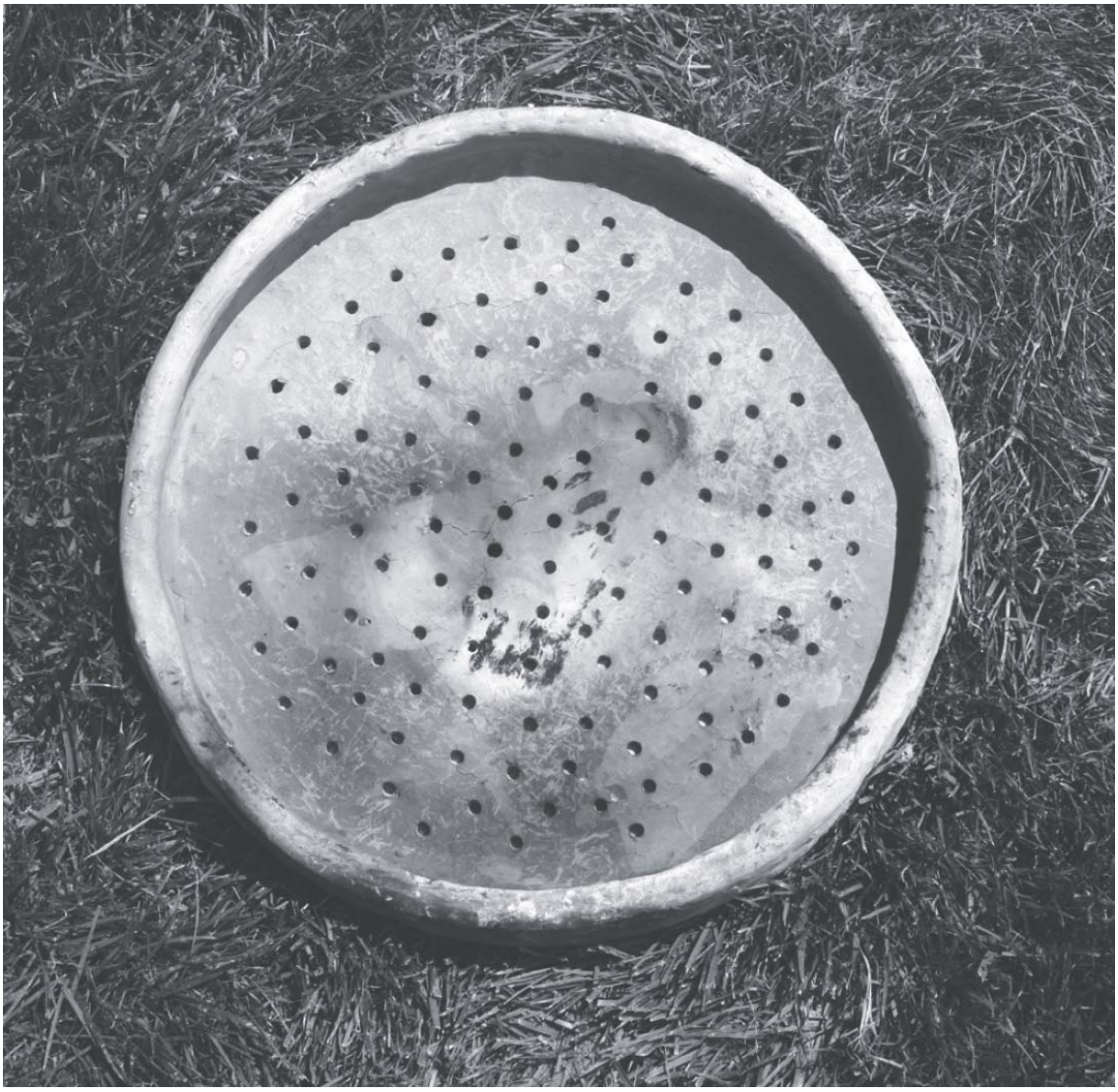


Figure 3.8. Underside of replica griddle, used with perforations down. Photo by the author

The only example I have seen that clearly was used perforation-side down is an LH IIIC one from the site of Phaistos (see Fig. 10.2).[6] While its handles are not extensively preserved, they seem to have been very close to the flat surface, such that it might not have been possible to have lifted it if it were placed perforation-side up. It is not clear why this particular example is different; it is a late specimen, and perhaps the shape had been seen and misinterpreted, or perhaps the potter who made it was aware of similar Italian shapes (see Chapter 10) or of southeastern European *pyraunoi* (Hochstetter 1983, 155–164), or perhaps the potter was simply aware of the advantages of a perforated underside for quickly increasing the object's temperature.

The griddle shape seems likely to be based on Near Eastern predecessors. Mary Voigt argued in 1983 that the shape known as a "husking tray" in the Hassuna period (7th–6th millennium BC) in what is now Iran, a close formal relative of the Mycenaean griddle, is likely to have served as a portable bread oven on the basis that it goes out of use at the same time that the fixed oven comes into use around 5000 BC (159), and we know that Anatolia and Cyprus have comparable forms by the end of the Chalcolithic in the mid-3rd millennium BC, continuing into the Late Cypriot period (Braidwood 1960, fig. 308: 16, 334:22-25; Frankel and Webb 1996, 130–133; Webb and Frankel 2011, 31).[7] More recent examples are also known from around the Mediterranean, including Israelite sites in the Early Iron Age (Kang and Garfinkel 2009, 127, 131, 132),

Punic Sardinia (Roppa *et al*. 2013), Classical to Hellenistic Pistiros in Bulgaria (Bouzek *et al*. 2013, pl. 38) and even into the 21st century; a steel version was made by Lagostina (Fig. 3.11), and John Younger claims that with a very small amount of oil, it makes "a great omelette" (personal communication).[8] Whether the tradition has been continuous from antiquity to the present is currently unclear.

Figure 3.9. Detail, griddle from Tiryns, in the Nauplio museum. Photo by the author; used with the permission of the Hellenic Ministry of Sport and Culture

In order to test the hypothesis that griddles worked well perforation-side up, Connie Podleski, then an art history and ceramics major at Berea College, and I made a pair of modern replicas.[9] Because it was not feasible to bring clay from Greece into the United States for the experiments, we attempted to replicate the properties of Greek cooking fabrics, using locally available materials in the United States. Both the griddles and the souvlaki trays at Pylos are made from coarse, non-calcareous fabrics with large siltstone inclusions, Galaty's type 1b (1999, 57–63). On the recommendation of Tina Gebhart, a ceramicist who specializes in materials issues, we blended two commercially available clays: Hawthorne, a fine-particle, low-firing earthenware fire clay from Missouri that is typically used today in the production of tiles (Hansen 2008a), and Red Art, a fine-particle, low-firing earthenware clay with moderate plasticity and a high iron content (Hansen 2008b). We tested a range of ratios of the two clays to find a workable match for the Mycenaean fabric, and found that a ratio of 6.6 Hawthorne Bond to 1 Red Art gave us a functional clay body. Because Galaty's petrographic analysis of the fabric type indicated that the original vessels contained high levels of siltstone inclusions, we also used a siltstone temper. The final proportions of the materials by weight were 33 Hawthorne to 5 Red Art to 9 siltstone.

Figure 3.10. Detail, griddle from Tiryns, in the Nauplio museum. Photo by the author; used with the permission of the Hellenic Ministry of Sport and Culture

While commercial clay was easily available for these reproductions, acquiring and breaking down the siltstone required much effort, despite our anachronistic use of steel tools. Indeed, the primary lesson that this experiment taught was to respect both the labor investment and the skill that ancient cooking pots must have required; it is not rare for contemporary archaeologists to refer to cooking pots or sherds derisively as "crudware" or "ugly," but as Skibo and Schiffer discuss, their production must have required a higher level of both expertise and labor than that of most of their more celebrated painted fineware cousins (1995).

As Podleski mixed the materials and wedged them, it was clear to her that this clay would be sturdy. The inclusions gave the materials what she calls "tooth," providing structural support and stability to the resulting vessels. She observed also that the production process was initially very rough on the hands, but that the longer she worked the materials, the less noticeable that was. She noted also that the dexterity and strength necessary to work with these materials would have required significant levels of training, and that wedging in particular required a high level of strength.

Based on observation of breakage patterns of archaeological examples of both griddles and souvlaki trays, she concluded that the originals had been slab-built. Since the clay was strong enough to hold together, she employed a combination of throwing slabs and rolling them with a rolling pin (rather than with a modern slab roller), to get the dimensions needed and to compress the materials. She used shapes and dimensions from archaeological examples to construct two griddles and two souvlaki trays, slipping joins, curing pieces, scoring joins, and attaching all parts (Fig. 3.12). The clay was dried slowly to prevent cracking.

For the griddles, once the clay had reached the leather-hard stage and the clay could withstand maneuvering, the perforations were added. The size and frequency of the distribution of perforations were based on those from the Pylos griddles. The Pylos griddles have surfaces that are polished at the exterior; they have been visibly smoothed, and while there is no evidence for burnishing *per se*, they are clearly different from untreated surfaces. Why the ancient potters might have bothered to polish their cooking pots was an open question.[10] When Podleski impressed perforations into the clay bottom, they pushed the clay on the reverse side into a series of small bumps, many of which had cracked profiles, weakening the vessel. Because she had created many tiny cracks, she used a wet, wooden rib to smooth the surface. In doing so – a necessary part of the production process, not an aesthetic choice – she accidentally created a somewhat polished surface.[11]

Figure 3.11. Modern "griddle". Photo courtesy of John Younger

When we tried the experimental versions, one with the perforated side up, the other with the perforated side down, we found that griddles are likely to have been often designed to be used on hearths, as they seem to make more efficient pans with the perforation side up. Our best evidence to date for the use of these vessels suggests that they were used for the production of breads, so we tried making flatbreads (Fig. 3.13). The perforations seem to enable the bread to avoid sticking, providing wells for oil to pool, heat, and expand.

While the popular press has frequently described these vessels as "non-stick" (*e.g*. Gannon 2014, Singh 2014),[12] that is a bit of an exaggeration; it is possible for food to stick, and some oil is required to prevent that.

We found that this vessel works beautifully for heating a thicker, more glutinous dough and badly for a thinner one. If it works best for dough with strands of glutinous proteins holding it together, perhaps it would work better for the more glutinous grain wheat than for barley. Furthermore, we discovered to our great dismay how critical it is to be able to move a griddle around. We did not build handles onto our examples, and we wished that we had; if a griddle is not placed exactly flat, the oil runs to one side (Fig. 3.14), and it is useful to be able to pull a griddle onto and off the coals. We learned, as well, why there is a blackened surface on the bottom of some griddles; when oil seeps through small cracks in the griddle, it burns into a thin, black coating (Fig. 3.15). This may have had additional benefits; as Rye pointed, black color can help retain heat (1976, 113). We also suspect we may have learned why some examples, like those at Pylos and Palaikastro and one from Mycenae, have substantial walls while others, like some found at Mycenae and Midea, do not. If you are cooking in a windy place and have no walls on your griddle, the ash from the hearth blows into your food. Walls should ameliorate this problem. On the other hand, walls also impede access to the food and increase the thermal mass of the vessel, which makes additional preheating necessary and flipping the food more awkward. One might choose, therefore, to use a griddle with higher walls if cooking in a windy location and a griddle without high walls if cooking in a calm one.

Figure 3.12. Podleski bonds the griddle wall to its base. Photo by the author

Figure 3.13. Two griddle replicas in use, one indentation-side up, one indentation-side down. Photo by the author

Figure 3.14. Griddle replica with oil pooling at one side. Photo by the author

To return to the question at hand, when were these specialized vessels in use? The earliest solidly datable examples come from LM/LH IIIA1 contexts. One comes from the Spartan Menelaion. While it is described as preserving "about half rim and floor and pt of one leg," the plates make it clear that this is in fact not a tripod griddle but is instead one with a wall, probably a high one (Catling 2009, 430, pl. 70). There are also LM IIIA1 examples from Khania (Hallager and Hallager 2003, 244; 2011, 357). The next example comes from a LH IIIA2 Petsas House context.[13] Most, however, seem to date to LH IIIB, including examples from Khania (Hallager and Hallager 2003, 244, 2011, 356–357), Gla (Iakovidis 2001, 109), Midea (Dalinghaus 1998, 136–137, Baumann 2007, 161), Mycenae (French 1969, 85; Μυλωνάς 1973, 106; Shear 1987, 112), Tiryns (Hiesel 1982, 439), and Tsoungiza (Thomas 2005, 524–525). Later contexts from Greece are the source of the Pylos examples, which come from an arguably LH IIIB/C transitional context but probably were already broken at that time (Blegen and Rawson 1966, 273, 274, 312, 332, 340), and two examples from an LH IIIB2–IIIC context at Mycenae (Catling 2009, 430). Only the Phaistos example and two from Tiryns are clearly LH IIIC, one dating as late as LH IIIC Advanced (Borgna 1997 and this volume; Stockhammer 2007, 148; Kilian 2007, 28). While the Laconia survey does report an example from near the

Menelaion as being Middle Helladic, it is not clear why; it comes from a mixed surface context that did include later material (Cavanagh *et al*. 1996, 22, 403, 405, fig. 12.4.2). Gulizio and Shelmerdine also report the existence of griddles in fabrics associated with the Middle Helladic through the end of the Late Mycenaean period (this volume), but because their fabric definitions are based on colors of clays and inclusions, which are heavily dependent on firing conditions or (in cases of site destruction through burning) re-firing conditions, rather than on petrographic analysis, it seems safer to suspend judgment until petrography has been done. Griddles, then, seem to have been in use throughout the LH IIIA through C periods, and perhaps rarely earlier, with a floruit in the LH IIIB period.

Figure 3.15. Underside of griddle replica, used with perforations up. Photo by the author

"Souvlaki trays"

Griddles were not the only specialized cooking vessels in use during the LH III period. In elite contexts at Pylos, Mycenae, and Gla, souvlaki trays are also found (Fig. 3.16). Earlier levels at Pylos and Mycenae have a reasonably large number of fragments of spit supports (Fig. 3.17), which seem to be a predecessor shape, as

does a shape with two spit supports attached by a floor that is currently only known from Crete, called "variant B" by Scheffer (1984, 158, 160). Their common trait of small depressions, likely for small spits, perpendicular to their walls suggests a common function. Georgiou's suggestion that the spit supports were unlikely to have been used for supporting spits in cooking because they are not found in pairs (Georgiou 1986, 24) now seems unlikely, since Akrotiri on Thera and the lower town at Mycenae both have matched pairs, complete with bulls' heads at the ends (Maggidis 2009; Doumas 2014, 46). Both forms are typically made of cooking fabrics, both tend to exhibit heavy burning, both lift the spits approximately 8 cm, and despite the current lack of definitive results from residue analysis,[14] it is generally agreed that both shapes were probably used for grilling meat on spits. The souvlaki tray has also been called a "grilling pan" (Blegen and Rawson 1966, 418), a "broiling pan" (Blegen and Rawson 1966, 418), a "grilling stand" (Iakovidis 2001, 109), an "open-sided tray with handles" (Wardle 1969, 293), an "open-ended tray" (Wardle *et al*. 1973, 326), and a "souvlaki dish" (French 2002, 112).

Souvlaki trays are more work to make than are spit supports, and they require more raw materials. Furthermore, souvlaki trays are heavier and require substantially more storage space. The shift we see at Mycenae, Gla, and Pylos to the souvlaki trays is likely to have had some real or perceived benefit to offset these drawbacks. That they were used to grill meat is entirely plausible, but it was not yet clear whether the coals were placed under or inside the tray (Hruby 2008, 154; Lis 2008, 147). If the coals were placed beneath the tray, then there would have been no flare-ups, and the drippings would have been drained off, where they may have formed the basis for gravies or other sauces. If the coals were placed inside the tray, the goal may have been to produce flare-ups as fat hit the coals, creating a crisp outer layer on the meat.

In our experiment, two "souvlaki trays" were given handles and indentations on the surface of their rims at the leather-hard stage. All four experimental vessels were left to dry, then fired very slowly to be sure that all moisture was removed; since the pieces were thick, there was a risk that they might explode during firing if not dried fully first. When we tried the pots, we discovered that the souvlaki trays do not work at all when the ambient temperature is too low; our first trial run was, due to various logistical constraints, on a bitterly cold and windy December day, and we were unable to cook anything on the souvlaki trays, regardless of whether the coals were placed in or under the vessel. The amount of cold, moving air between the coals and the meat was simply too great. When we tried again in May (Fig. 3.18), we found that the heat did not transfer through both the vessel and the air, and the only way to cook with such a vessel was to place the coals inside, much closer to the meat. As a result, we should envision these as either designed to cause the fire to flare up and sear the meat or as portable cooking devices, to be used perhaps at a convenient height or for Mycenaean expeditions away from home.

Spit supports are known from dozens of sites, with early examples dating to the Early Bronze Age in Asia Minor, and MM III–LM I examples from Thera and from Mallia on Crete (Scheffer 1984; Doumas 2014). A date range for Mainland sites is more difficult because they tend to be found in mixed contexts, but they seem to continue in use into the Early Iron Age at Nichoria (McDonald *et al*. 1983, 163). The only prehistoric sites from which I know of souvlaki trays, by contrast, are Gla (Iakovidis 2001, 109), Mycenae (Wardle *et al*. 1973, 327), and Pylos (Blegen and Rawson 1966, 418), where they come from LH IIIB, LH IIIB2, and LH IIIB/C contexts respectively.[15] This confirms the fact that they should be identified with a rise in elite consumption during the LH III period, and it may hint at a relationship between elite cuisine and portability; those who journeyed substantial distances may often have been elites.

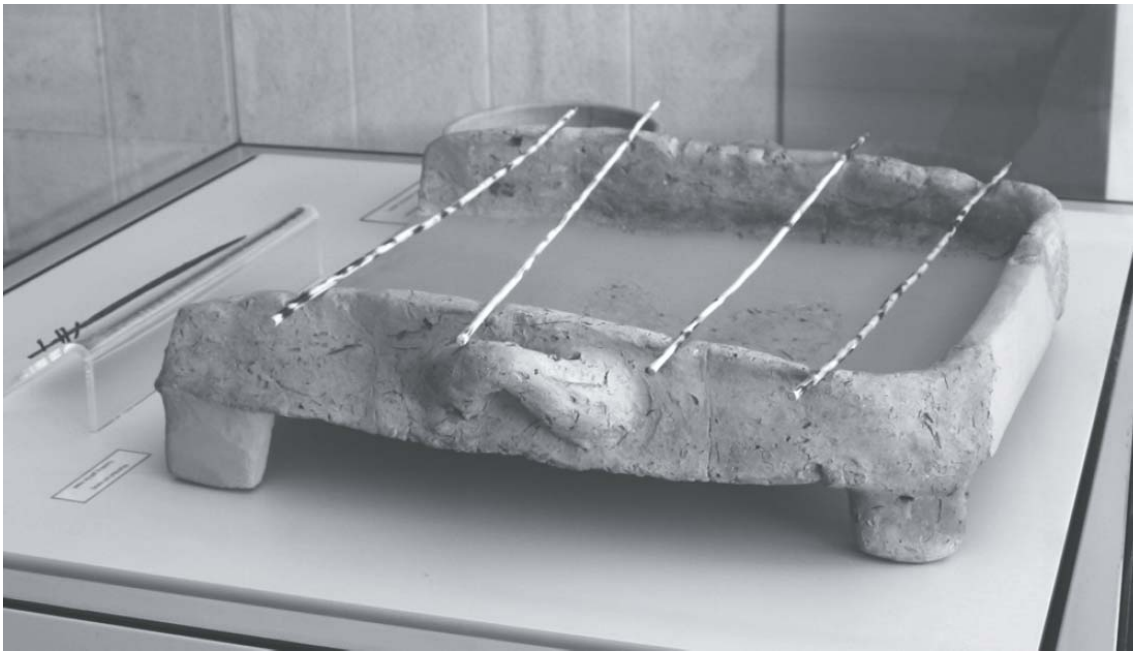


Figure 3.16. Mycenae souvlaki tray, in the Mycenae museum. Photo by the author; used with the permission of the Hellenic Ministry of Sport and Culture

Figure 3.17. Pylos spit support sherds. Photo by the author

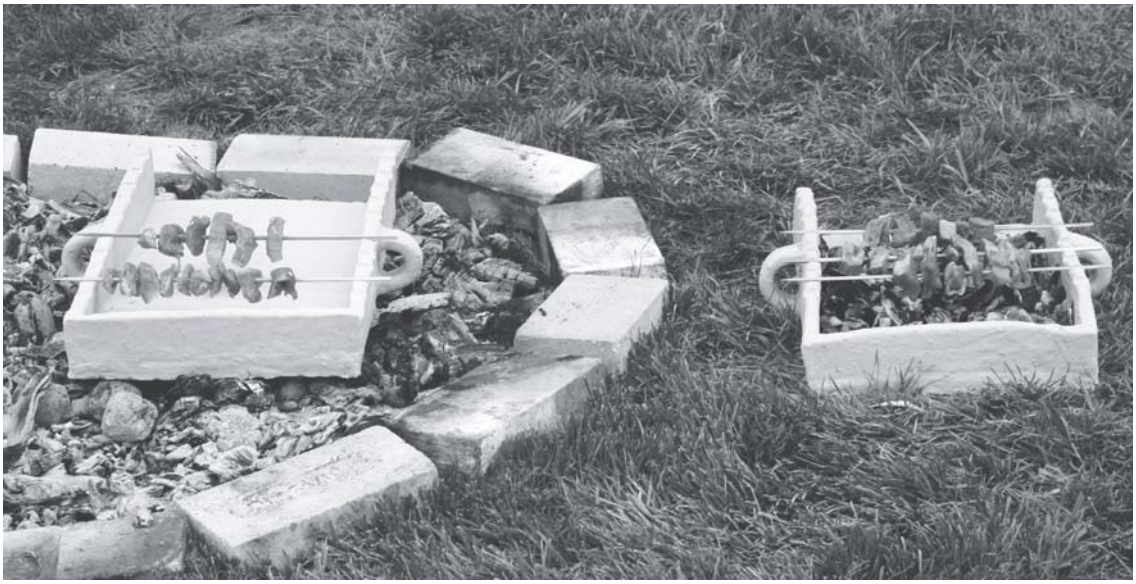


Figure 3.18. Replica souvlaki trays, on and containing coals. Photo by the author

Implications

Why do new types of cooking vessels appear during the LH III period? Perhaps to simply have wine was no longer enough to mark elite status, and the quality of food and drink became increasingly important. While Linear B tablets such as PY Vn 20 attest that palaces still oversaw the distribution of tens of thousands of liters of wine to second-order sites, there is reason to question how broadly available wine might have been (Bennett 1973, 253). As Palmer points out, viticulture is labor-intensive, requiring a large quantity of concurrent labor, so "a self-sufficient farmer probably aimed to produce enough grain and olives to meet his needs for the coming year, before he could afford to raise vines in any quantity" (1995, 273), and he must have had access to significant familial or other labor resources; yet viticulture was a part of the traditional agricultural system, so access was probably not restricted outright (1994, 187). Hamilakis claims that two members of the so-called "Mediterranean Triad" (olive oil and wine) were not so heavily embedded in the traditional agriculture as is typically assumed and that they were in fact relatively new (1999, 42–45). Hence, we should not automatically assume that wine, and the knowledge and technology for its production, was universally available.

There is, however, direct textual evidence that at least small quantities of wine were available to non-elite members of society. Tablet PY Un 718 inventories contributions to a feast from various members of society; the smallest contribution is provided by the *wo-ro-ki-jo-ne-jo*, argued by Nikoloudis (2008, 589–591) to represent the non-native and non-citizen members of Pylian society. The *wo-ro-ki-jo-ne-jo* provides no animals, five cheeses, a moderate amount of honey, and a very small amount of wine, just a few liters. The fact that even the *wo-ro-ki-jo-ne-jo*, probably a lower-status group, is able to give some wine suggests that Palmer's evaluation is a plausible one, that while the growth of large quantities of vines does require significant labor input and stability, the tending of small numbers of vines or perhaps the creation of wine from wild grapes might have been within the reach of small landholders or even the landless, albeit in small quantities.

The fact that in Linear B the word for wine is often accompanied by adjectives and the fact that there is some evidence for an international wine trade suggest that wine came in a variety of types, and this may reflect a shift from a system in which simply having and consuming alcohol was sufficient to establish class to a system in which taste had begun to emerge as a factor. It is probably not an accident that this shift seems

to occur at the same time that conspicuous consumption in other realms, such architecture and wall painting, also begins to flourish (Bennet and Davis 1999, 106, 115); however, architectural conspicuous consumption in the form of palace-building in Messenia seems to suffer later in the LH IIIB period. As we gain better chronological resolution regarding cuisine, whether from cooking vessels, from paleoethnobotany, or from other sources, it will be interesting to learn whether and to what extent culinary innovation tracks architectural and other expenditures, or to what extent those expenditures track culinary ones.

Notes

1 The author would like to thank Elisabetta Borgna, Reinhard Jung, Sara Levi, and Jeremy Rutter for their comments on the paper, all the participants in the AIA 2014 session and Catalin Cristescu for helpful discussions, and Jeremy Hayne and Bela Dimova for discussions and references. She would also like to thank Sharon Stocker for permission to use images of material from Pylos and the Hellenic Ministry of Culture and Sports – Archaeological Receipts Fund for permission to use images she took in the Nauplio and Mycenae Museums, which are under the supervision of the Ephorate of Antiquities in the Argolid. Many thanks to Connie Podleski for her assistance making the replicas and editing the initial conference paper, to Z. Larry Lipchinski who advised us on geological matters, to Mike Galaty for sharing his research on Messenian clay recipes, to Tina Gebhart and Karin Solberg, respectively the ceramics professor and resident potter at Berea, who provided a great deal of pragmatic support, and to Tina's husband Alan Whetsel and to various Berea students, who helped tend the fire.

2 It is not clear how much of the circumference the walls enclose; from the examples at Pylos, it looks like it must be at least one-third but less than three-quarters. That at Palaikastro appears to enclose about three-quarters (Dawkins 1902, 325).

3 E.g., Khania: Hallager and Hallager 2011, pl. 140; Gla: Iakovidis 2001, shape 12; Midea: Walberg 1998, pl. 89; Walberg 2007, fig. 179; Mycenae: French 1969, 86, Μυλωνάς 1975, 107; Palaikastro: Dawkins 1902, 325; Pylos: Blegen and Rawson 1966, fig. 348: 12; Tiryns: Schliemann 1976 (originally 1885), 116.

4 E.g., Laconia: Cavanagh *et al*. 1996, fig. 12.4.2; Mycenae: French 2002, 112; Phaistos: Borgna 1997, 197; Sparta: Catling 2009, pl. 70b, d; Tiryns: Hiesel 1982, 438–439, Kilian 2007, taf. 22.267.

5 The indentations at Pylos are somewhat variable in depth even within a single vessel, ranging from less than 20% of the base thickness to over 80%, depending on how close they are to the margin and on the idiosyncratic motor habits of the potter.

6 Elisabetta Borgna has also been kind enough to share with me an image of another comparable example, also from Phaistos.

7 At least some of the Cypriot examples seem to have been used perforation-side down; see Ταραμίδης 1999.

8 My thanks to John Younger for discussing his frying pan with me and to many of the members of the Ancient Food Tech email mailing list, who came up with a lengthy list of uses to which the modern equivalents are put, ranging from baking flatbreads to roasting chestnuts.

9 While I wondered briefly whether residue testing might clarify the orientation question, the fact that oil tends to seep into clay bodies made that approach seem unlikely to provide helpful results.

10 Elisabetta Borgna suggests that reducing porosity might have been a goal. This is certainly plausible, if indeed there was a conscious choice involved.

11 It is also possible that the glossy surface may reflect a chemical rather than a purely mechanical process; salt in a clay body can have the same effect.

12 On the basis of the paper presented at the 2014 AIA meetings and interviews with the author. Note that while Gannon 2014 and Singh 2014 were both based on interviews, many of the articles written were based on other articles, and as a result, some are quite fanciful.

13 Many thanks to Kim Shelton for her permission to mention these unpublished examples. They are apparently walled, probably low-walled.

14 Unfortunately, it is not clear whether residue analysis of the tray from Mycenae proved conclusive; the original catalogue describes the residues as "cooking meat cannot be excluded" (Tzedakis and Martlew 1999, 134), but the scientific report says in one location that the result is "cooking meat" (Tzedakis and Martlew 2008, xvii) and "the

sherd yielded identifiable contaminants and a single fatty acid, myristic acid (C14), which gives no clue for its former use" in another (Beck *et al*. 2008, 43).

15 I have also heard of a comparable shape being used later in Romania but have not been able to confirm this.

4

Mycenaean cooking vessels from Iklaina

Joann Gulizio and Cynthia W. Shelmerdine

Introduction[1]

Coarse wares are often overlooked in the study of Mycenaean pottery. One reason is the belief that cooking vessel shapes and fabrics change very little over time and therefore cannot inform us about regional and chronological differences in political, economic, and social structure. A systematic study of coarse wares from the site of Iklaina, however, demonstrates that changes in cooking vessels reflect important changes in Mycenaean society.

Excavations at Iklaina, conducted under the auspices of the Athens Archaeological Society and the direction of Michael Cosmopoulos, are revealing the remains of a Mycenaean town, believed to be the second order center **a-pu*^{2} (* = reconstructed nominative form) in the Mycenaean state of Pylos (Cosmopoulos 2006; Shelmerdine 2016). Two major Late Bronze Age building phases have been identified across the site (Fig. 4.1). During the later phase (LH IIIA2 late–IIIB2), Iklaina was likely under the administrative control of the Palace of Nestor; in the earlier phase (LH I–IIIA2 early), the site may have been politically autonomous. Iklaina therefore provides ideal conditions for examining the effects that this transition had on material culture and lifestyle. This paper focuses on three different types of cooking vessels that occur with some frequency at Iklaina: spit supports ("souvlaki stands", actually a piece of cooking equipment rather than a vessel), griddles and tripods.

Spit supports

Scheffer (1984) defines three types of spit supports: Type A consists of single supports used in pairs, Type B has a floor joining the two side supports, and Type C has a floor and a wall along one end as well as the sides. Only Type A is attested at Iklaina. Scheffer cataloged only about 16 examples of Type A (some references are to several fragments). They come from Crete (Khania, Mallia, Palaikastro), the Greek mainland (Asine, Pylos), Asia Minor (Aphrodisias, Miletus, Tarsus), Lefkandi on Euboea, Phylakopi on Melos, and Akrotiri on

Thera. All date to the late Middle and the Late Bronze Age, except one Early Bronze III example from Aphrodisias. Spit supports were uncommon enough that Scheffer thought they were probably for special feasting occasions and not for everyday use. But at Iklaina 45 examples have been found so far, ranging in date from Middle Helladic to LH IIIB. Nine excavation loci yielded two or more fragments, but they are never part of the same support and are often in different fabrics. For a span of several hundred years this is not a large quantity, but it suggests that this equipment was not quite as rare as was first thought. Since Scheffer wrote, other examples have also come to light, *e.g.* from Mycenae (Wace 1921–1923, 239, 259, 264), Tsoungiza (Thomas 2005, 524 no. 431, fig. 32: 2), Midea (Demakopoulou *et al*. 2002, 50, fig. 77), and the Menelaion (Catling *et al*. 2009, 429–430) on the Greek mainland, and from Ayia Irini on Kea (Georgiou 1986, 23–28, cat. nos 91–117, pls 5, 17), though Georgiou believes they were used in the manufacture of metals, rather than for grilling meat. The mainland examples all date to LH II–IIIB; some of those from Ayia Irini are of Middle Bronze Age date.

The examples from Iklaina range in height from 7.9–12.5cm; spits rested in the depressions on the top. The shape is an inverted T, with one vertical and one sloping side (P2207, Fig. 4.2; P3491, Fig. 4.3). The flat base is usually wider and better finished on the vertical side, traces of burning are less frequent than on the sloping side, and the edges of preserved holes are also a little smoother. For these reasons, the vertical side seems to be the exterior. Six examples preserve one or two holes pierced through the lower wall (P2207, Fig. 4.2; P2849 and P3069, Fig. 4.3). Two supports have hole diameters of 1.3cm (P1952; P3069, Fig. 4.3), two of 1.5cm (P1134; P2849, Fig. 4.3) and two of 1.8cm (P2207, Fig. 4.2; P3553). None of our examples is complete, but it appears that two holes was the standard number. It seems likely, as Scheffer (1984, 159) proposes, that these holes are for lifting the hot supports from the fire. In support of this interpretation she notes that holes only occur on Type A examples, not on Types B and C, which have handles. Scheffer mentions but refutes other possible uses for these holes, including spit holders and ventilation holes. Catling *et al*. (2009, 429) suggest that these holes were used to tie one spit support to its counterpart, but this interpretation seems equally implausible.

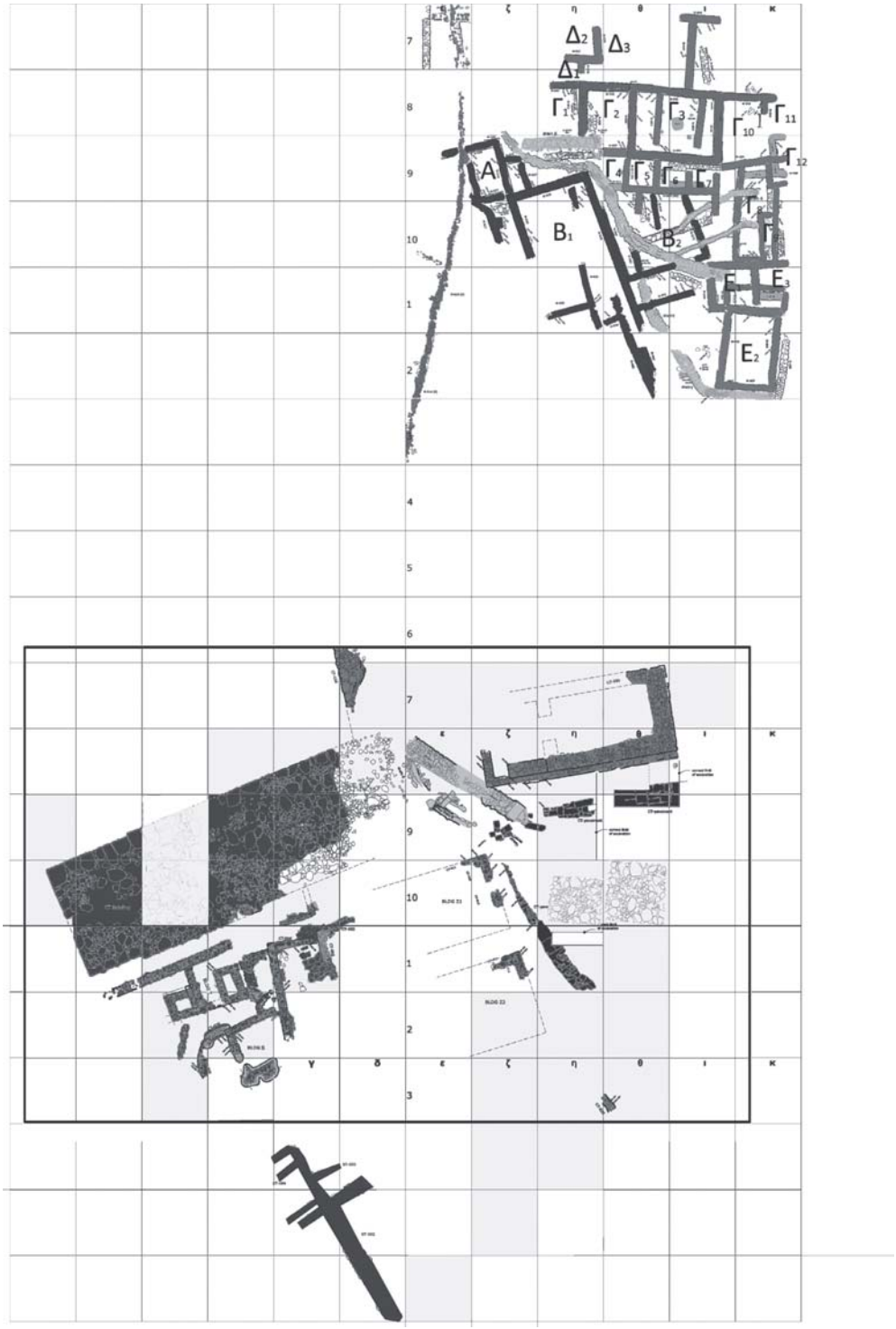


Figure 4.1. Site plan of Iklaina excavations. Courtesy of Michael Cosmopoulos

The dates we assign to the supports are usually based on fabric, since most of their find contexts are mixed. Thirty-one of the 45 Iklaina spit supports in coarse and semi-coarse fabrics can be dated to general periods (Table 4.1). Most of these fabrics are illustrated in Figure 4.3; full descriptions will appear in the forthcoming publication of the Iklaina survey.

The form of the spit supports remains the same from fabric to fabric, and thus from period to period (Table 4.2). Furthermore, most of the datable supports are in Early Mycenaean coarse fabrics, like Tan Grog ware (P3489, Fig. 4.3), even when the context is predominantly Late Mycenaean. One possibility is that

certain fabrics were retained for specialized forms like these, while going out of use for more common vessels. But if our dating is correct, the shape is introduced toward the end of the Middle Helladic period, as attested by only one uncataloged example in Middle Helladic coarse ware, and peaks during Early Mycenaean period. Thirteen examples were found in various Middle Helladic-Early Mycenaean fabrics and eleven examples in Early Mycenaean fabrics. The number of examples in Late Mycenaean fabrics is much smaller: three in Late Mycenaean coarse and three in Late Mycenaean coarse tan. This statistic may simply reflect our excavation priorities to date, since Type A spit supports are attested in LH IIIB contexts at Mycenae, Tsoungiza, and the Menelaion. Excavations at Iklaina have concentrated primarily on the southern part of the site, where we have reached Middle Helladic and Early Mycenaean levels; in the northern sector we have not consistently gone as deep. If the decline is real, though, we might speculate that the grilling of meat was practiced more widely during our earlier phase, when Iklaina was independent, and was more restricted under palatial control during LH IIIA2–B, perhaps because grilling became an elite cooking method. This inference accords well with the Linear B evidence that palatial administrators regulated communal feasts at which meat was served (Palaima 2004), though the tablets do not specify how the meat was prepared.

Table 4.1. Fabrics identified at Iklaina

Phase	*Cooking vessel fabrics*
Middle Helladic (MH II–III)	Middle Helladic coarse
Middle Helladic–Early Mycenaean (MH III–LH IIB)	Very coarse orange Hard orange Coarse orange
Early Mycenaean (MH III–LH IIB)	Tan grog Early Mycenaean gray orange Micaceous
Early–Late Mycenaean (LH I–IIIB2)	Mycenaean orange
Late Mycenaean (LH IIIA1–B2)	Late Mycenaean semi-fine Late Mycenaean coarse Late Mycenaean coarse tan

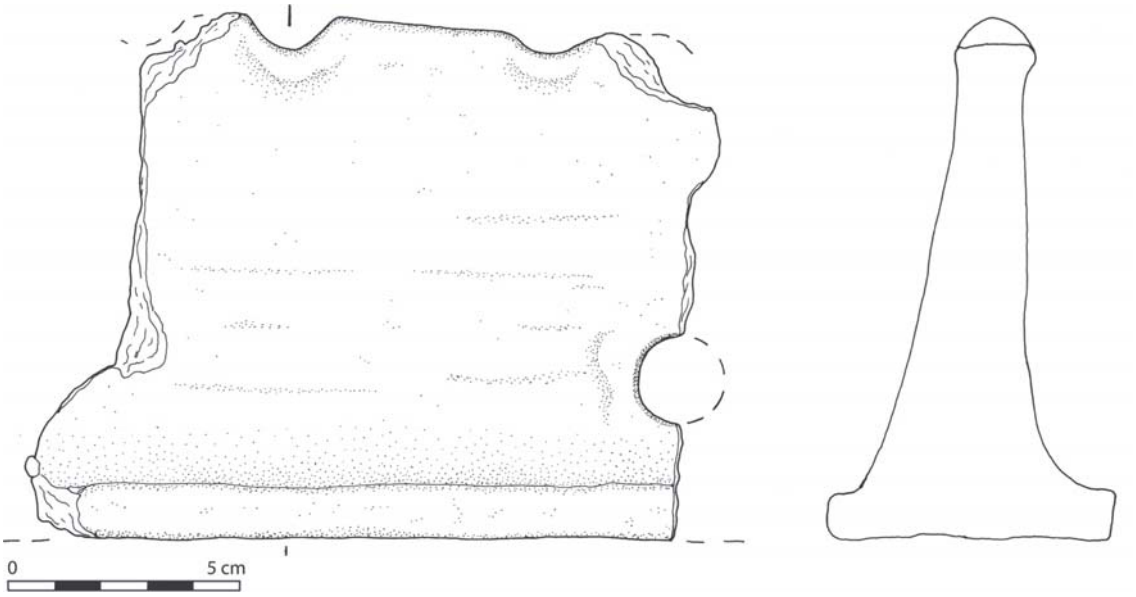


Figure 4.2. Spit support P2207 from Iklaina. Drawn by Yannis Nakas

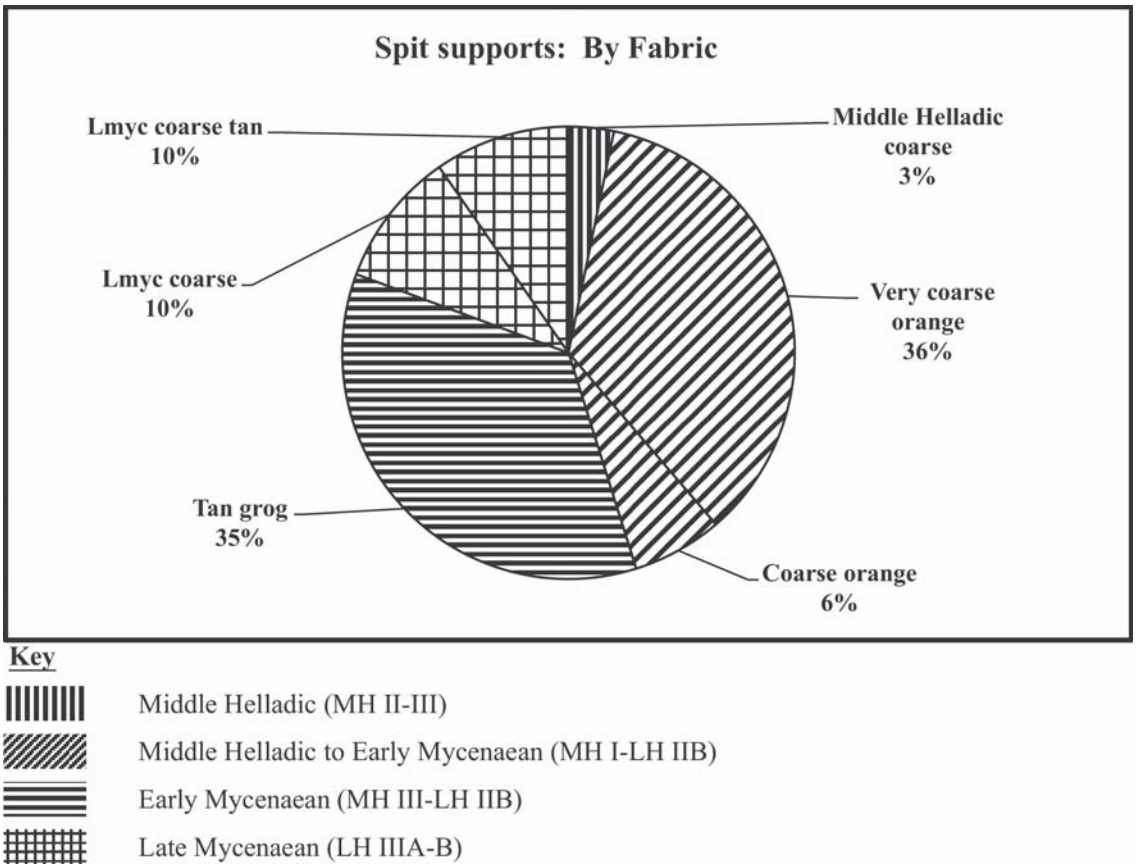


Table 4.2. Distribution of spit supports by fabric

Griddles

Nineteen griddles have come to light thus far at Iklaina, none of them complete. Most bases are in the range of 1–2 cm thick, with one outlier (P2936, Fig. 4.4 left) at 2.9cm. Four griddles have thin side walls: P2180

(Fig. 4.5) in Very Coarse Orange ware is the best preserved, with two holes pierced through the lower side. P2212 and P3730 in Tan Grog ware and P3803 in Middle–Late Helladic coarse ware also have sides, but no evidence of side holes, and very little of the bases survive. Some bases are flat, while others are slightly raised. Holes punched into one side occur in a variety of arrangements, from arcs to straight lines. Most bases are fairly shallow (P1909, Fig. 4.4, center), but the unusually thick example P2936 also has unusually deep holes, and P2972 (Fig. 4.4, right) has extremely shallow depressions, probably pressed in with fingertips rather than punched.

The range of fabrics is similar to that for spit supports. Five are in Tan Grog ware, an Early Mycenaean fabric, and two more in Very Coarse Orange ware, a fabric in use during the Middle Helladic and Early Mycenaean periods. Only one example is in a definitely Middle Helladic fabric (an uncataloged sherd from N13 a1 β3 locus 13) and one in a definitely Late Mycenaean fabric (P2868). If representative, these indications suggest griddles were primarily used during the Early Mycenaean period. Our current sample, however, may be too small to be statistically significant, and their mixed contexts include plenty of Late Mycenaean sherds. In addition, LH IIIB examples are known from Tiryns (Hiesel 1982, 439 no. 10, fig. 57), Mycenae (Shear 1987, 111–112, nos 148, 149, pl. 33), Midea (Demakopoulou *et al*. 1997–1998, 66, fig. 44; Dalinghaus in Walberg 1998, 136–137), Tsoungiza (Thomas 2005, 523–524, no. 430, fig. 32.1), the Menelaion (Catling *et al*. 2009, 430–431), and Pylos (Blegen and Rawson 1966, 340–341, nos 11–12, fig. 348, 10–11). It is likely that the use of griddles was not much affected by the transition to palatial control.

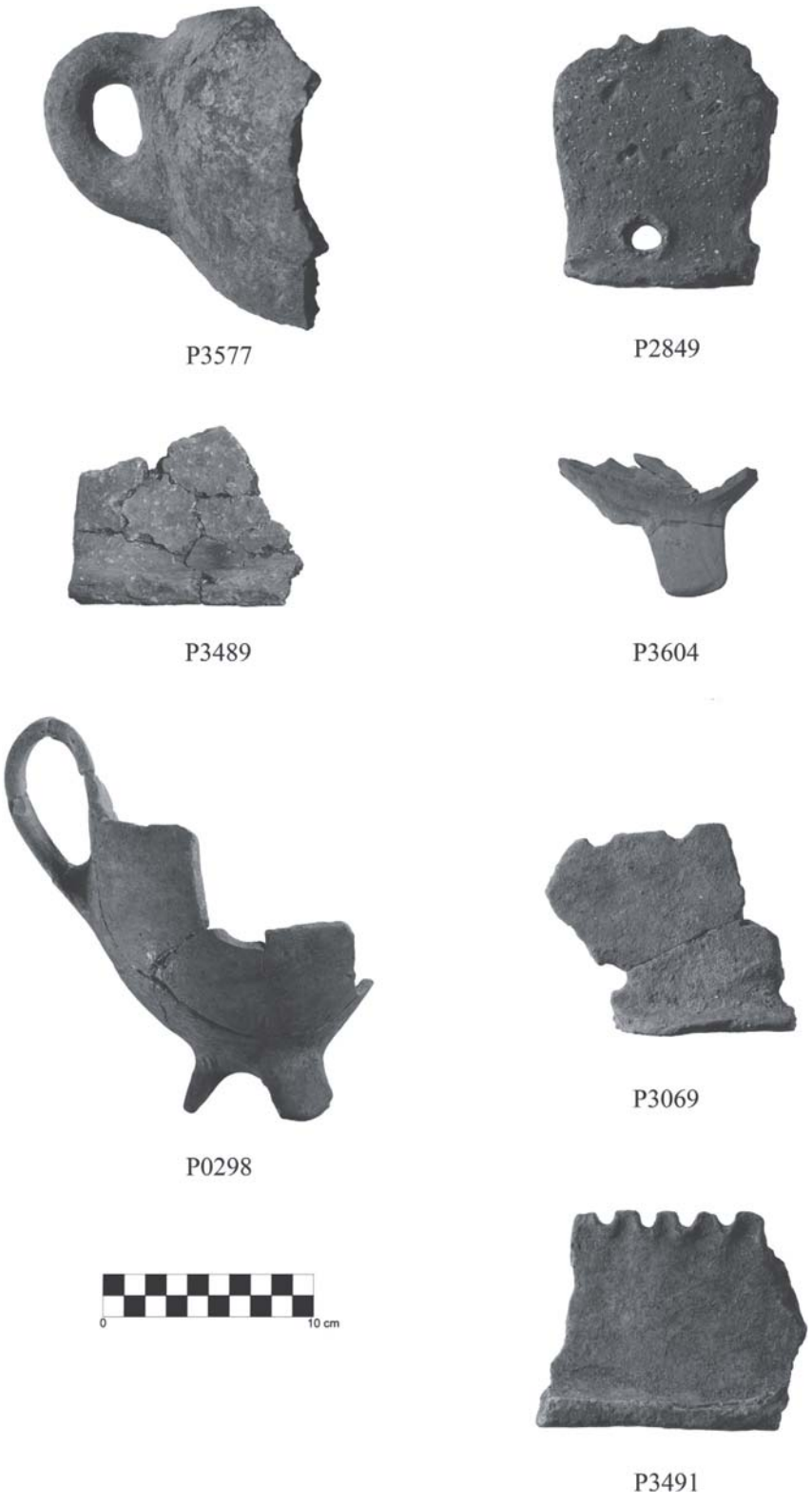


Figure 4.3. Examples of pottery fabrics from the Iklaina excavations: Tripod cooking vessel P3577 in Middle Helladic coarse ware; spit support P2849 in Very coarse orange ware; spit support P3489 in Tan grog ware; Tripod cooking vessel P3604 in Early Mycenaean gray orange ware; Tripod cooking vessel P0298 in Mycenaean orange ware; spit support P3069 in Late Mycenaean coarse tan ware; spit support P3491 in Late Mycenaean coarse tan ware. Photographed by George Vdokakis

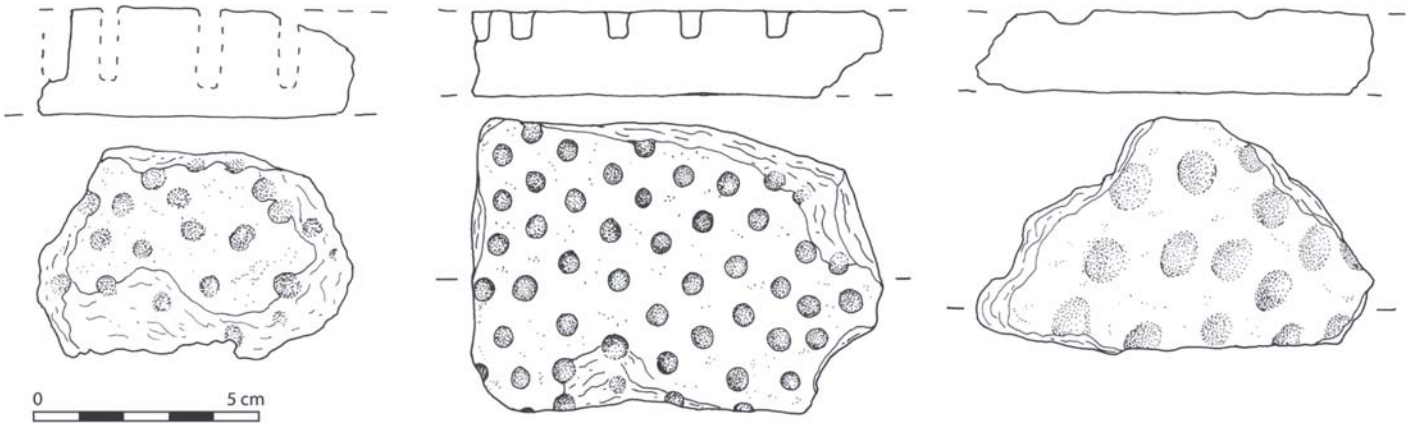


Figure 4.4. Griddles showing depth of punches: (left) P2936; (center) P1909; (right) P2972. Drawn by Yannis Nakas

The evidence from Iklaina strongly suggests that griddles, at least the great majority, are oriented with the holes on the upper side, not the bottom (see further discussion in Hruby, this volume). On seven examples only the unpunched side is burnt, suggesting to us that this side was exposed to the fire. Most of the comparative evidence supports the orientation with holes on the upper side. Both pieces from Tsoungiza (Thomas 2005, 523–524, no. 430, LH IIIB1) are burnt on the unpunched side; these are two different vessels, one with a flat base and the other with a raised base. The Midea griddles and no. 148 from the Panayia Houses at Mycenae (Shear 1987, 112, pl. 33, LH IIIB) are also burnt on the unpunched side. No. 149 from Mycenae (Shear 1987, 112, pl. 33, LH IIIB), however, is not burnt. Both have a raised base and a short side wall. Two published examples come from Pylos (Blegen and Rawson 1966, 340–341, fig. 348.11, 12, LH IIIB2). Figure 348.11 has a side wall with a horizontal handle on the exterior; Blegen assumed a corresponding "handle shield" on the opposite side. No. 149 from the Panayia Houses also shows a thickening for a handle.

A few examples of griddles have been published with the punches on the underside and reconstructed as tripods. The most plausible mainland example comes from Tiryns Room 152 (Hiesel 1982, 439, no. 10, fig. 57), but even here two of the feet are reconstructed. Hiesel calls it a "dreibeinigen Tragherd," a portable stove. Traces of burning are confined to the unpunched side. No. 149 from the Panayia houses with its thickening for a leg or handle, might be of this type too, though it was published with the holes on top. Again, however, only the unpunched side is burnt and so is more likely to have been the underside. On the basis of the Tiryns example, Catling reconstructs a grill fragment from the Menelaion as a similar vessel, with three broad "legs" forming a stand (Catling *et al*. 2009, 430–431, ET 193, fig. 104, pl. 70) (Fig. 4.6). In this orientation it would resemble the LH IIIC portable hearth from Phaistos discussed in this volume (Borgna and Levi, Fig. 10.2), rather than an actual griddle. Only the top of one "leg" is preserved, however. If the reconstructed portions of the drawing are removed and the image is flipped so the punches are on the upper side (Fig. 4.7), this element is plausibly an extension of the wall to form a handle shield. As noted above, such a shield is preserved on one of the Pylos examples, where the direction of the handle shows that the perforations are on the upper side. We suggest this may be the correct orientation of Menelaion ET 193. It is especially close in size to P2180 from Iklaina (Fig. 4.5).

Blegen and Rawson (1966, 341) suggested that these griddles might be waffle makers. The holes are too small to make this likely, but cereal and oil residue have been identified on the Midea example referred to above (Dalinghaus in Walberg 1998, 219, no. 680, pl. 89; Tzedakis and Martlew 1999, 126, no. 105). The diameters of better-preserved examples are in the range of 34–45cm, and it may be that large pancakes or flatbreads were cooked on these griddles (Hruby, this volume). The holes would allow heat to penetrate well

and evenly through the base. We should add, though, that the preceding review of Iklaina griddles and their comparanda shows some variation in the forms of vessels subsumed under this name. Some differences are minor, but others, like the presence or absence of substantial side walls, may be significant. Substantially different variants may have had different functions in the Mycenaean world. Our etic classification of all vessels with hole punches as “griddles” should probably be rethought.

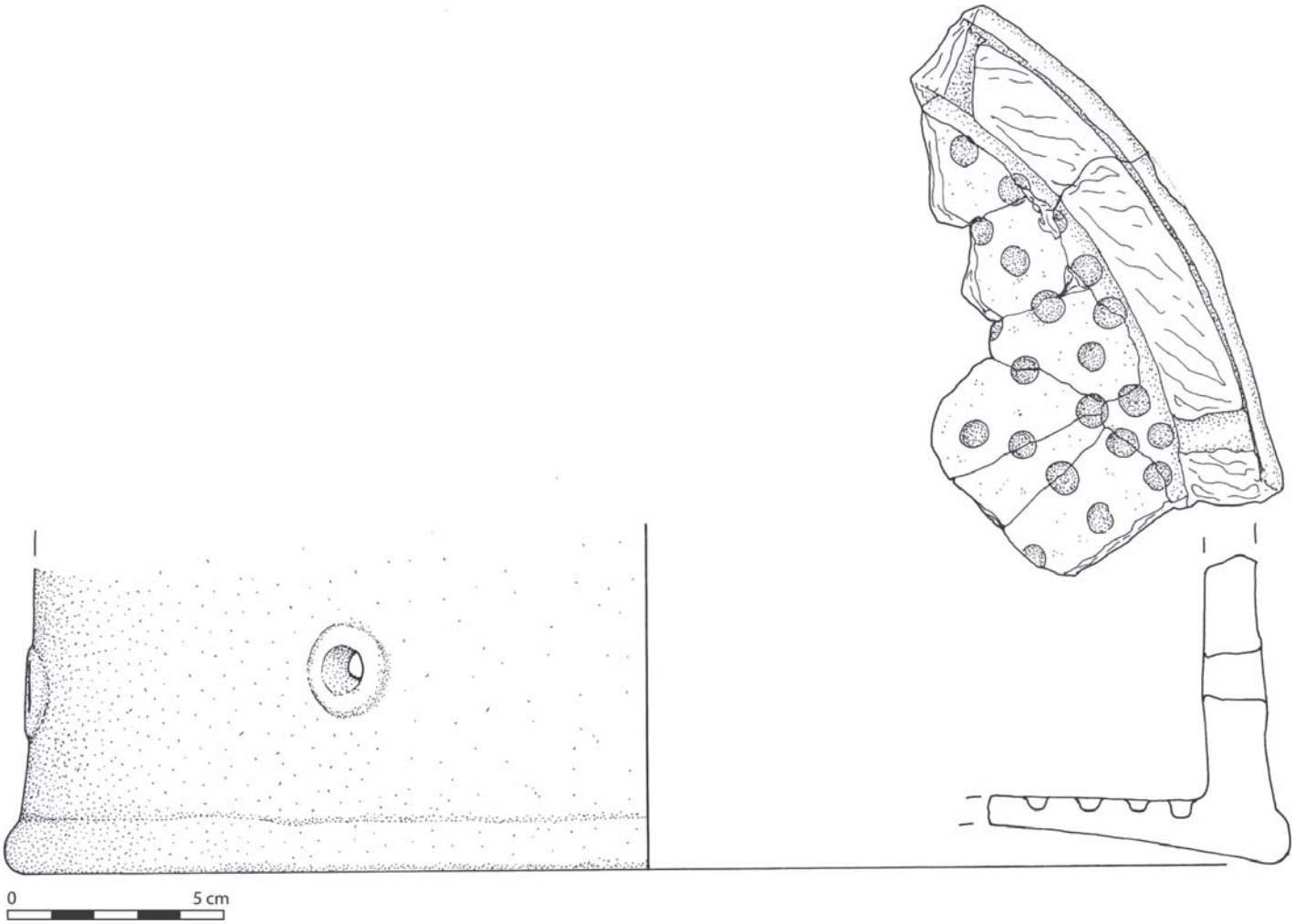


Figure 4.5. Griddle P2180 from Iklaina. Drawn by Yannis Nakas

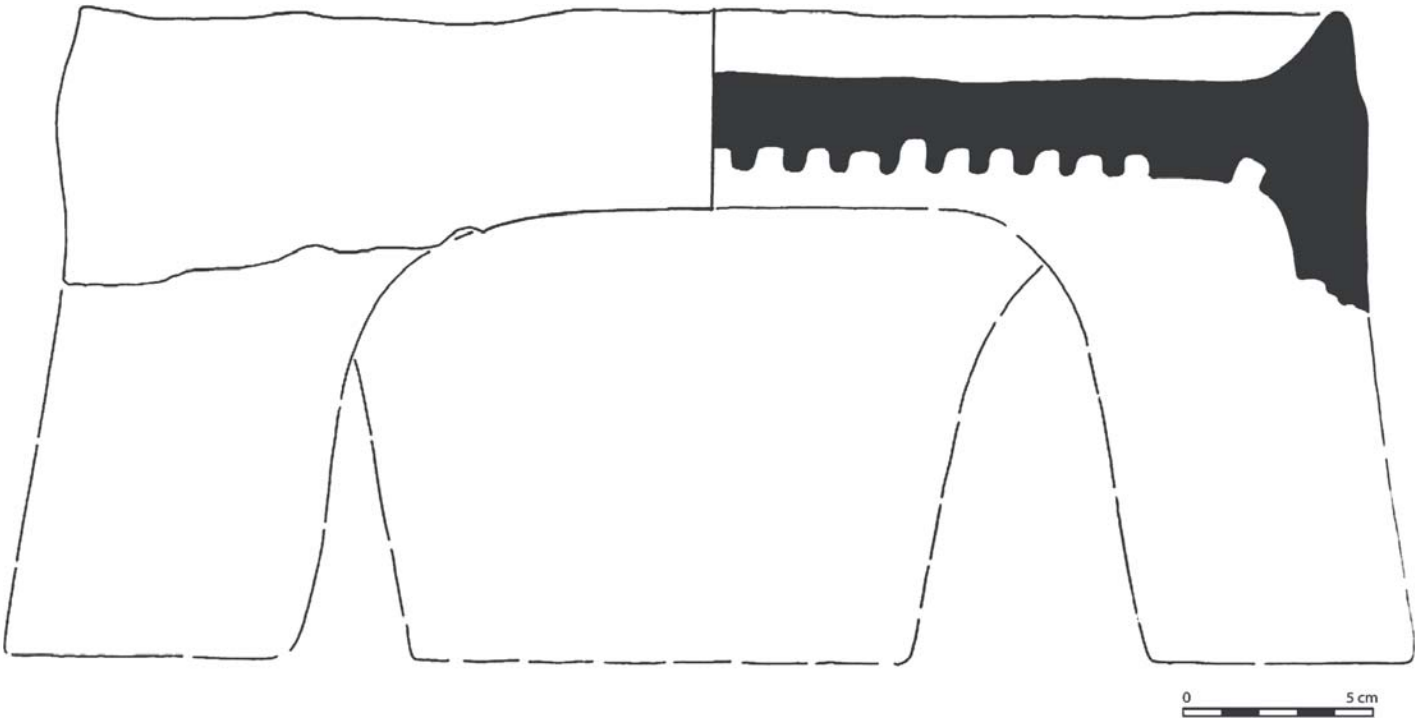


Figure 4.6. Griddle ET 193 from the Menelaion as reconstructed by the excavator with punches on the underside. Courtesy of the British School at Athens

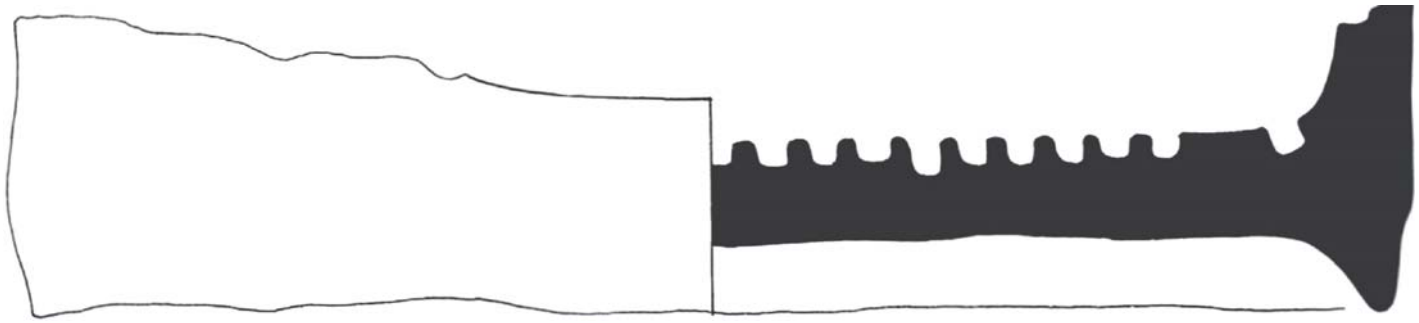


Figure 4.7. Griddle ET 193 from the Menelaion as reconstructed by the authors with punches on upper side (based on Fig. 4.6)

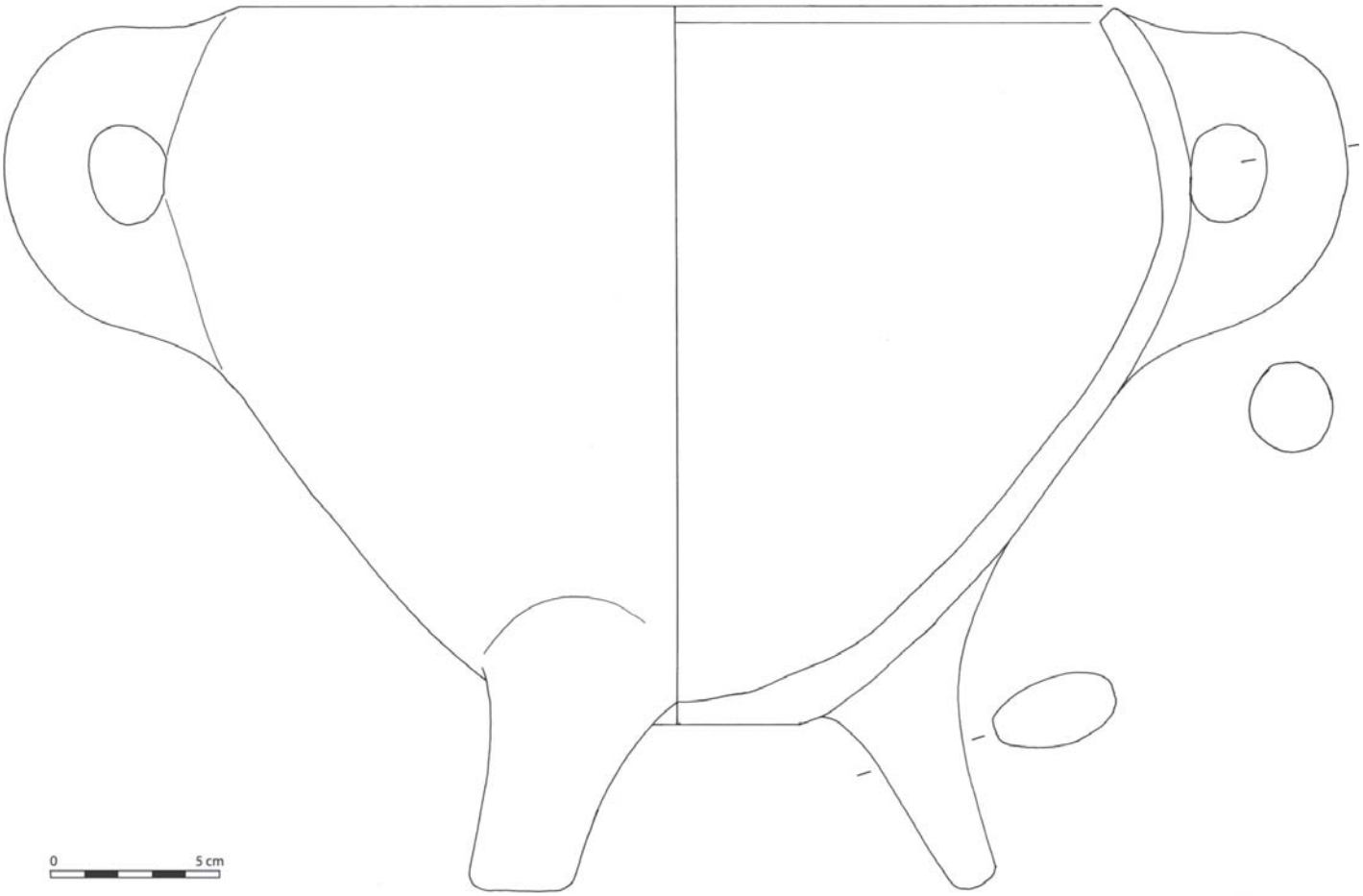


Figure 4.8. Tripod cooking vessel P0753 from Iklaina. Drawn by Yannis Nakas

Tripods

Tripods are a Minoan shape introduced into mainland Messenia during Middle Helladic II–III (Dickinson *et al*. 1992, 480; Davis *et al*. 1997, 440–441). Though the shape continues to be used throughout the Late Bronze Age, it seems to flourish in the Early Mycenaean period (as seen in Messenia and Laconia in particular). At the Menelaion, the tripod cooking pot is held to be a LH IIB–LH IIIA1 shape and had disappeared by LH IIIB (Catling *et al*. 2009, 425). At Iklaina too, tripods appear to be the dominant cooking vessel from the late Middle Helladic period into the Early Mycenaean period. Over 500 examples of tripods have been identified at Iklaina so far. Only three complete profiles have been reconstructed (P0298, Fig. 4.3; P0753, Fig. 4.8; P3207, Fig. 4.9), but several rims with attached handles also provide a fairly consistent picture of the typical tripod profile. Of course, legs make up the majority of sherds belonging to this shape. The durability of tripod legs allows them to survive in the archaeological record and the uniqueness of the sherd shape allows for the unmistakable identification of the tripod form. Only a few bases have been identified, perhaps because identification of a tripod base is difficult without some indication of an attached leg preserved.

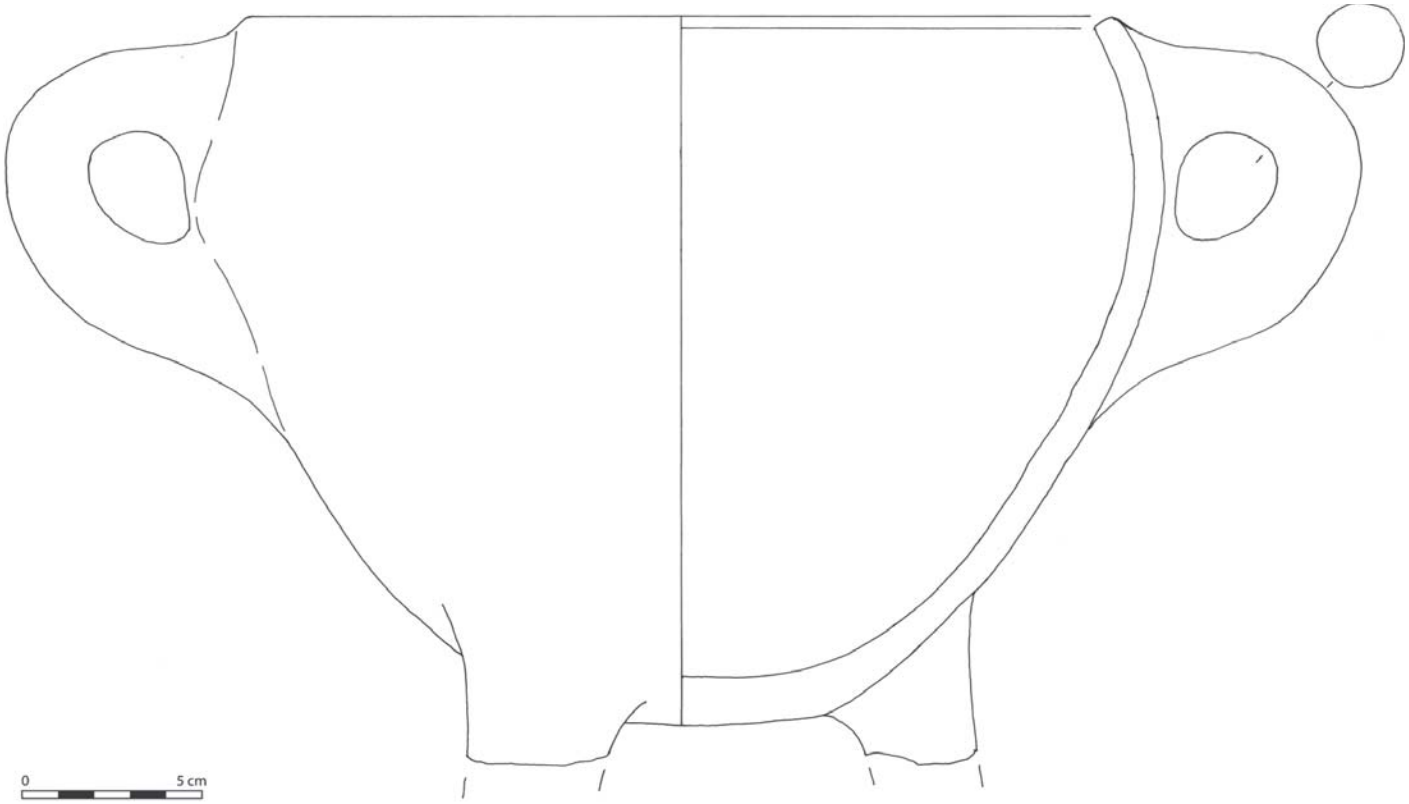


Figure 4.9. Tripod cooking vessel P3207 from Iklaina. Drawn by Yannis Nakas

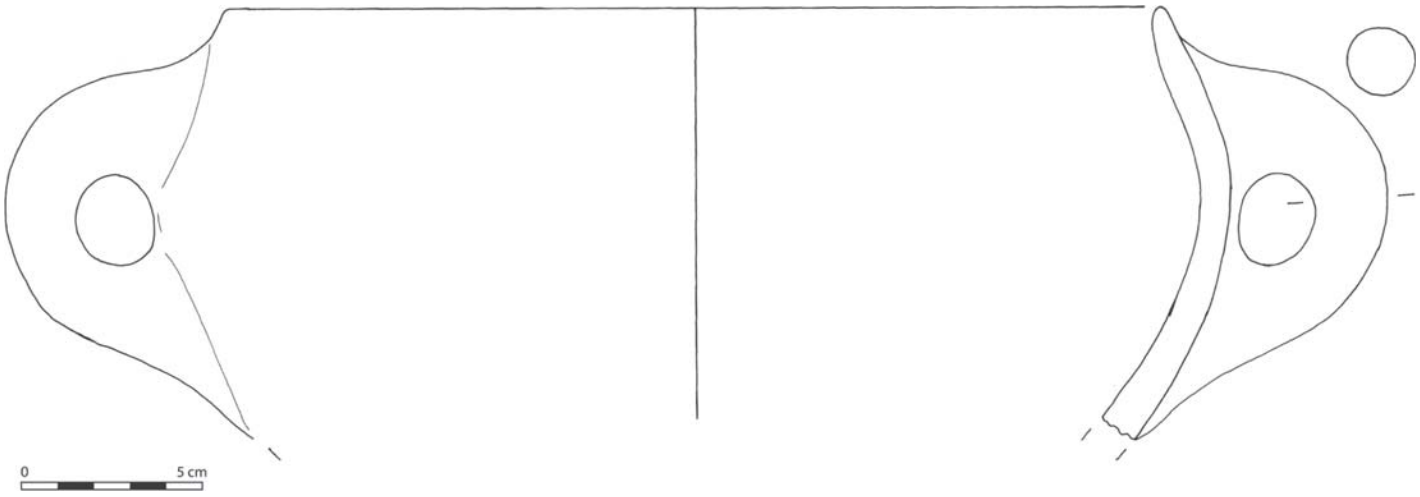


Figure 4.10. Tripod cooking vessel P1499 from Iklaina. Drawn by Yannis Nakas

Tripods from Iklaina occur in a wide variety of sizes and shapes. Most examples have incurving lipless rims, which are either pointed (P1499, Fig. 4.10) or, more frequently, flattened at the top (P0753, Fig. 4.8), sometimes with a slight ridge on the top of the rim. The handles are round and vertical (P3577, Fig. 4.3), joined at the rim (P0753, Fig. 4.8), just below the rim or at the shoulder (P1499, Fig. 4.10). One unique example has a high-swung strap handle (P0298, Fig. 4.3), and another has a thick vertical handle with a rectangular section. Tripod bodies are usually quite globular, tapering slightly toward the bottom. Bases are either rounded (P0298 and P3604, Fig. 4.3) or flat (P0753, Fig. 4.8), but a raised concave base was also identified (P2199, Fig. 4.11). Tripod legs are usually oval in section. A few examples are waisted (P3461, Fig.

4.12), or taper slightly toward the bottom (P0753, Fig. 4.8), while others are squared off and/or flattened on the bottom. More elaborate examples have vertical grooves or ridges. Legs range from very short to quite long and thin. The length of the legs is not necessarily proportional to the height of the vessel. In the case of P0298 (Fig. 4.3), the vessel is quite tall in relation to its very short legs.

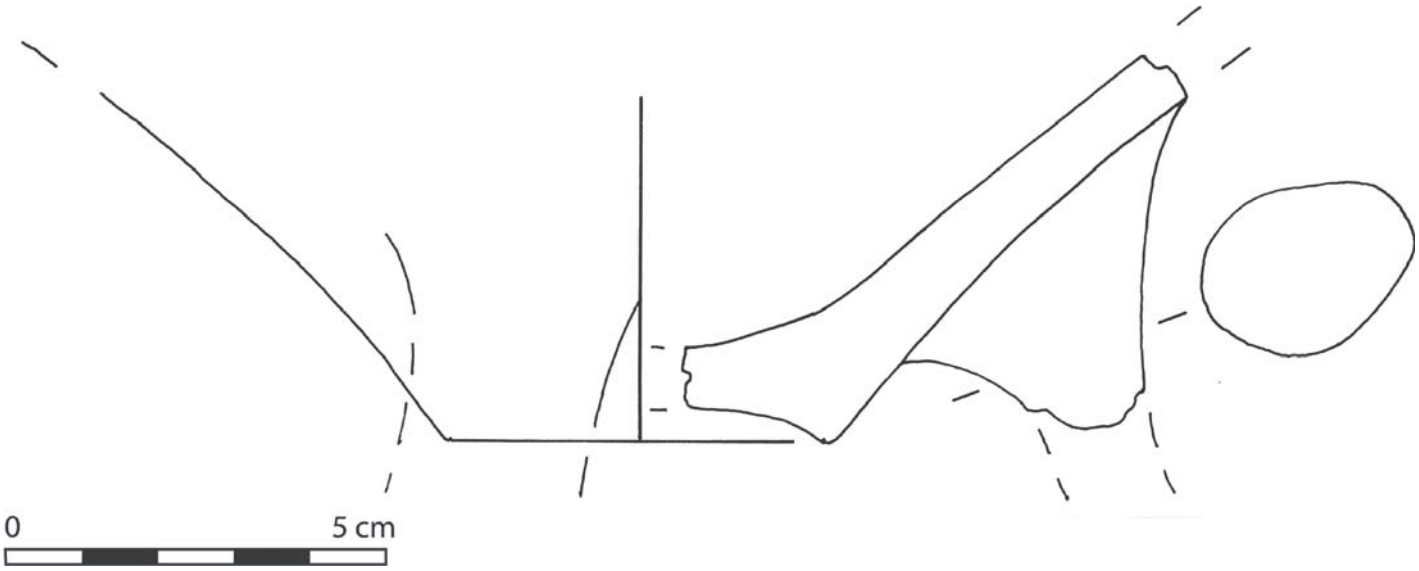


Figure 4.11. Tripod cooking vessel P2199 from Iklaina. Drawn by Yannis Nakas

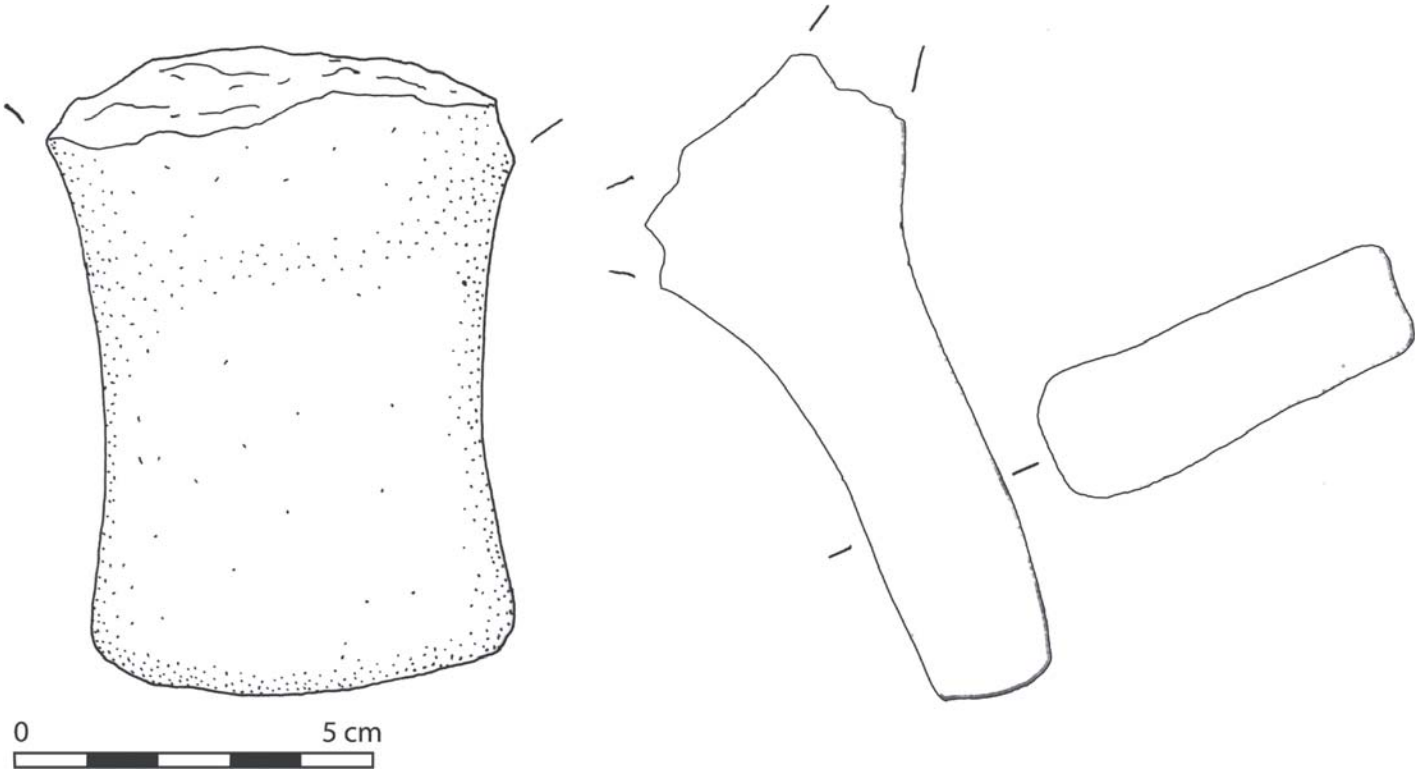


Figure 4.12. Tripod cooking vessel P3461 from Iklaina. Drawn by Yannis Nakas

Tripods in Messenia are generally distinguished by incurving rims. The closest parallels to the Iklaina tripods come from Nichoria (Dickinson *et al*. 1992, 537, P3637 and P3638, fig. 9.35, LH IIIA1). The only

example of this form known to us outside Messenia is from Mitrou (LP782-030-018; Lis 2012b, 87; Lis, this volume, Fig. 5.4). Elsewhere, tripods typically have everted or spreading rims, as for example in Laconia at the Menelaion (ET 172 [Fig. 4.13], ST 125, and CLO 57, LH II–IIIA1), in the Corinthia (Lis, this volume), and in the Argolid (survey material: Runnels *et al*. 1995, 203 nos 947–949, fig. 49, LH; Mycenae: Shear 1987, 112 nos 145–146, fig. 21, LH IIIB; Asine: Frizell 1980, 112–113, no. 262, fig. 12, LH IIB–IIIA1).

Interestingly, tripods with everted rims are attested at the Palace of Nestor, but these are small, individual-serving tripods and date to late LH IIIB (Blegen and Rawson 1966, 411–412, figs 395–396, shapes 69–70; Lis 2006, 2008). We are not sure if this represents a chronological evolution, or simply a variant restricted to vessels of small size.

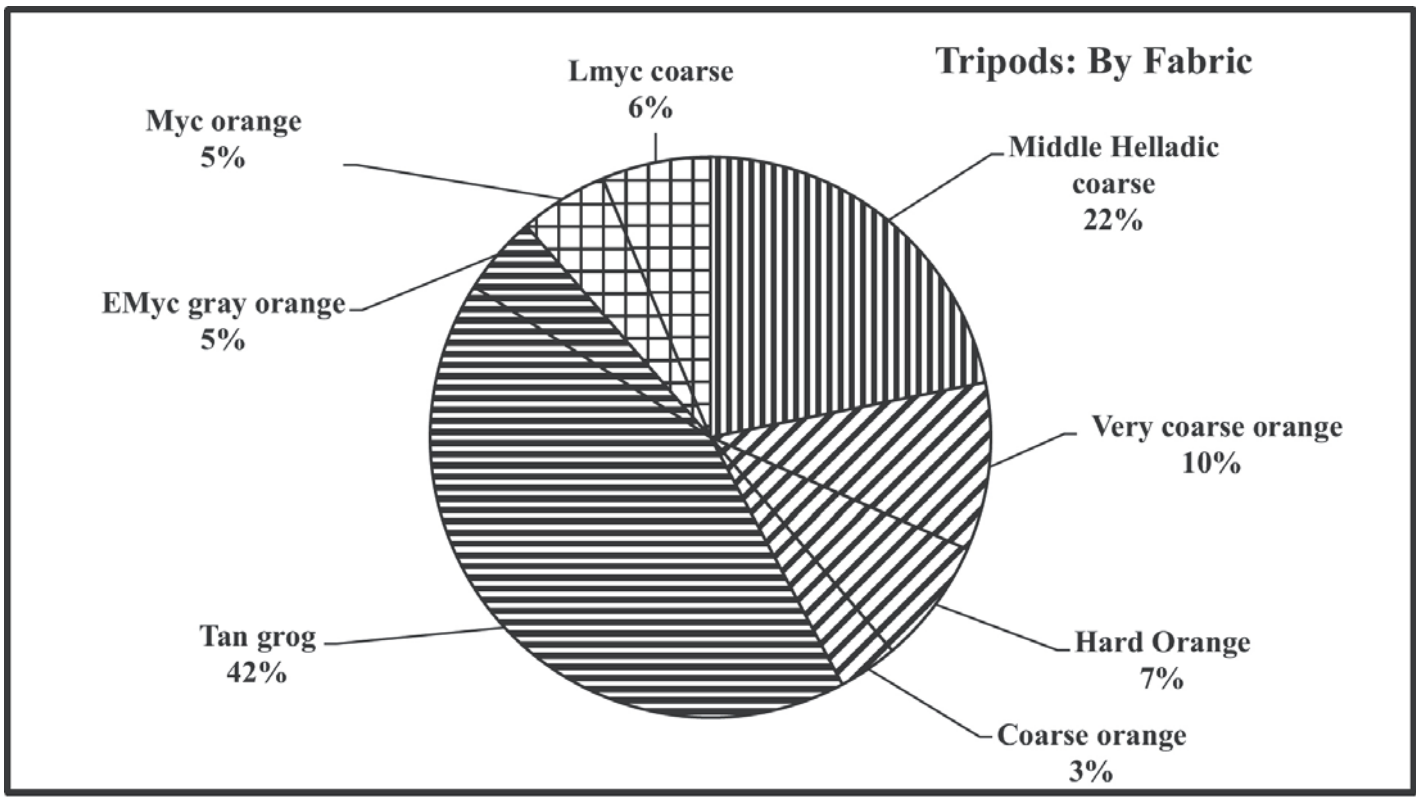


Table 4.3. Distribution of tripods by fabric

Figure 4.13. Tripod cooking vessel ET172 from the Menelaion. Courtesy of the British School at Athens

Tripods from Iklaina occur in a wide variety of fabrics, mostly coarse but some in semi-fine and rare examples in fine fabrics (Table 4.3). Of these, 85% of the Iklaina tripods are in coarse ware, 15% are in semi-fine wares, and 1% are in fine wares. Tripods most frequently occur in Tan grog ware (42%), the most common coarse ware of the Early Mycenaean period, but a substantial percentage (22%) occurs in Middle Helladic coarse ware (P3577, Fig. 4.3). What is most notable is the considerable drop-off in tripods made out of Late Mycenaean coarse wares (6%). As mentioned above concerning spit supports, it is possible that our Early Mycenaean coarse fabrics may continue into the Late Mycenaean period for specialized shapes such as tripod cooking pots.

At the very least, it does seem that Messenian tripods with incurving rims fade out during the Late Mycenaean period. At Nichoria too, the latest incurving tripod rim identified is LH IIIA2 late (Dickinson *et al*. 1992, 542, P3736, fig. 9–48). At Iklaina we currently have only three incurving rims and two rim and handles of tripods in Late Mycenaean coarse ware. No complete profile of a tripod has yet been found in a secure LH IIIB context at Iklaina. Small legs are attested, but no rims or handles can be securely identified as coming from the small individual-serving tripods typical of LH IIIB at the Palace of Nestor. It is possible that

the tripod shape changes under the control of the palace, perhaps to conform to tripod shapes from Laconia and the Argolid with everted rims. However, in the absence of the legs it is impossible to distinguish everted tripod rims from similar rim profiles found on other coarse vessels.

Conclusions

This examination of coarse wares from Iklaina suggests a noticeable change in the use of cooking vessels between our earlier and later phases. Tripods, spit supports and griddles are widely used throughout the Early Mycenaean period and into LH IIIA, but tripods certainly seem to decrease in use thereafter, and spit supports may as well. At Iklaina, and perhaps at the Menelaion also, the move away from tripods coincides with the transition from autonomy to palatial control. The cooking pots of the earlier phase are more diverse in type and easier to identify than their later counterparts. Later material is more uniform, with everted rims in a variety of sizes that could belong to a number of different shapes, and undifferentiated flat bases. The diversity of Early Mycenaean shapes and fabrics, in comparison to the increasingly standardized Late Mycenaean types, is a pattern seen in fine decorated pottery also, as well as in the production of other commodities. The change is rightly interpreted as a consequence of the shift from independent polities to centralized administration. It seems that cooking vessels may also conform to this pattern. In addition, if the reduction in the use of spit supports during LH IIIA2–B is real, we could infer that the grilling of meat by individuals at the local level was reduced under palatial control, perhaps replaced by banquets organized by palatial elites where meat was provided. For these reasons, we propose that changes in cooking vessels at Iklaina during the Late Bronze Age may reflect real changes in Mycenaean cooking and eating habits, resulting from Iklaina's absorption into the state of Pylos.

Note

1 The authors would like to thank Debra Trusty, Bartłomiej Lis, Jeremy Rutter, and Patrick Thomas for their helpful comments on this paper, and Kevin Pluta for assistance with the illustrations.

5

Mycenaean cooking pots: Attempt at an interregional comparison

Bartłomiej Lis

Introduction[1]

After decades of almost total neglect toward cooking pottery, comprehensively addressed in the article by Debra Trusty (this volume), the situation is rapidly improving, and this volume, resulting from a colloquium held during the 2014 AIA meeting in Chicago, is another welcome event in what is already a series of conferences partly or solely devoted to cooking pottery. A wide variety of topics have been raised with regard to cooking vessels, but what has been missing so far, at least to my knowledge, is any attempt at an interregional comparison of their development during the Greek Bronze Age. The factor responsible for the lack of such studies is the dearth of well-published sequences of cooking pottery from sites that were occupied over long periods of time. This is also the reason why I chose not to undertake such a comparative task for my doctoral thesis and concentrated mostly on one site, Mitrou (Lis 2012b).

The title of my contribution may suggest that the situation has changed to such an extent that it is now the time to undertake such comparisons, but to say this would be slightly misleading. The choice of the sites included here, Mitrou, Tsoungiza, and the Menelaion (Fig. 5.1), is by no means accidental. These are the only three sites from which material for such a comparison encompassing the Late Bronze Age (LBA) was readily available to me. LBA cooking pottery from Mitrou constituted the topic of my dissertation (Lis 2012b), while the publication of Bronze Age levels from the Menelaion has recently appeared (Catling 2009). Additionally, I have conducted a thorough study of the entire LBA cooking pottery sequence at Tsoungiza,[2] which complements older publications on deposits from that site (*i.e*. Rutter 1989; 1990; 1993; Thomas 2005; 2011).

For the sake of comparison, I have divided the analyzed period into three parts: the Early Mycenaean period (as defined here from Late Helladic [LH] I–LH IIIA1/2),[3] the Palatial period (LH IIIA2–LH IIIB), and the Post-Palatial period (LH IIIC). This rough division, one of many possible, works rather well for the analysis of many aspects of Mycenaean culture, including the pottery. Because of limits of space, I will not

offer a thorough discussion of every shape and its variations, as each site would require at least a separate article, if not a monograph. Instead, I will focus on four major aspects of cooking pottery and their respective diachronic changes:

- The form of the most common cooking pot type,
- The composition of the assemblages, *i.e*. types of cooking pots used simultaneously at a particular site,
- The presence of specialized cooking equipment, which is different in form, and presumably function, from the most common types of cooking pots,
- The method of cooking, as much as it can be understood from the general shape and other indications.

The analysis

Early Mycenaean period

During the Early Mycenaean period, one can see two separate branches of cooking pottery that have very different courses of development at both Tsoungiza and Mitrou (Fig. 5.2). The first, which is relatively short-lived, is a direct continuation of a Middle Helladic tradition. It is a non-homogeneous group of usually large "domestic" pots made from coarse fabrics (with largest inclusions exceeding 4 mm), usually burnished, and fired at low temperatures. All of this evidence suggests household production with a very low output and degree of specialization. I use the term "domestic" as they probably fulfilled a variety of functions, ranging from cooking to storage.[4] Additionally, their mottled appearance, which is a result of uncontrolled firing conditions, makes it virtually impossible to determine their function from secondary burning marks alone. Their forms are simple, their features are not well-defined, and they possess a variety of handle types, including lug and horseshoe handles (Fig. 5.2). This group disappears rather quickly within the period, and wider availability of workshop-manufactured, good quality cooking pottery can be suggested as a trigger for this process.

Figure 5.1. Map showing sites mentioned in the text

The other group is made of better quality, medium-coarse fabrics (with the largest inclusions clustering between 2mm and 4mm), more carefully executed and with better-defined morphological features. These vessels seem to be fired at higher temperatures and under better-controlled conditions. Their forms, apart from general similarity of elongated bodies tapering to narrow bases, are site-specific (Fig. 5.2). Cooking pots belonging to this group from Tsoungiza feature shoulder handles and everted rims; those at Mitrou have handle(s) starting from an everted and thickened rim. Both have narrow bases, sometimes referred to as "button bases" (*cf*. discussion of Menelaion pottery below). At Tsoungiza, the genesis of these cooking pots is rather easy to guess, since they are similar to contemporary Aeginetan cooking pots (see Gauss *et al*. this volume), and it is tempting to see them as some sort of imitation. The origin of this group of cooking pots at Mitrou is unclear.

The cooking pots of the second group from Tsoungiza and Mitrou continue to be produced not only throughout the Early Mycenaean period, but also well into the Palatial period. The LH I cooking pot from Tsoungiza can be considered a prototype of the most common LH IIIB cooking pot, not only locally at Tsoungiza or regionally in parts of the Corinthia, but also in the entire Argolid. The form, which was already present in the LH I period, develops slowly from one with an everted rim and a shoulder handle into a type with a tall, nearly vertical rim and one or two shoulder handles (Fig. 5.3). This development did not originate

at Tsoungiza, but it is so far the only site in the broad area where these changes could be followed with such precision.

The Menelaion has not been mentioned so far, because substantial, stratified deposits there start rather late, around the LH IIB/IIIA1 period. Therefore, it is impossible to follow the development that led to the forms discussed below. Nevertheless, the main type of cooking pot, referred to as a "button-based jug" in the publication (Catling 2009, 423), is not unlike those typical of Tsoungiza and Mitrou in general proportions, though it differs in the position of the handle and profile of the rim. The handle is high-swung, quite unusual for a cooking pot, and most rims have convex interiors. Therefore, the form, beyond general proportions, is again site-specific.

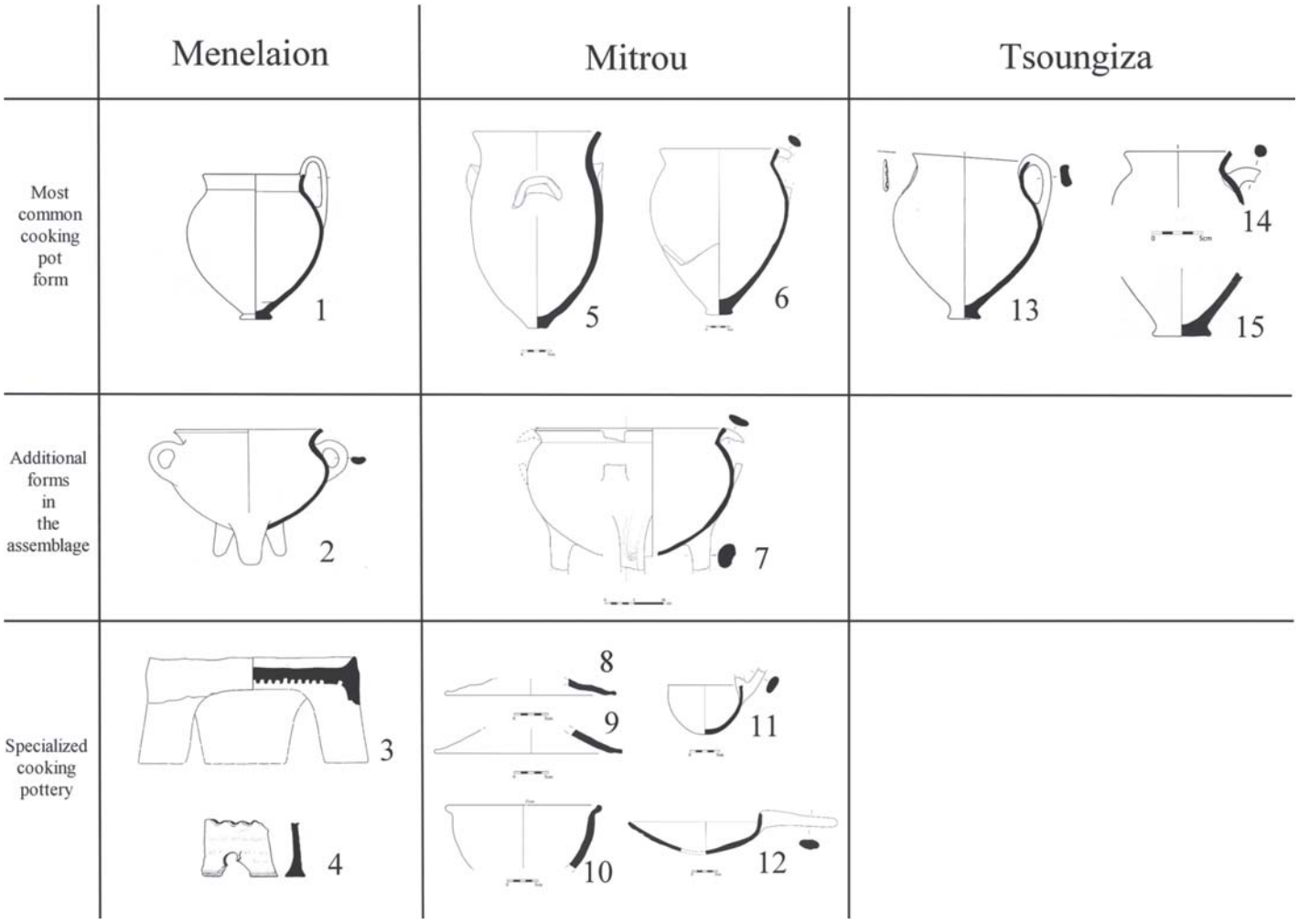


Figure 5.2. Cooking pottery of the Early Mycenaean period. Menelaion (from top): IV21 [1], ET172 [2], ET193 [3], ET195 [4] (Catling 2009, 106, fig. 129; 92, fig. 102; 93, fig. 104); Mitrou: LE792-018-012 [5], LR770-042-012 [6], LG790-025-017 [7], lids: LE792-017-018 [8], LE792-041-011 [9], basin: LD791-056-011 [10], dipper: LL785-016-039 [11], frying pan: LL785-016-031 [12]; Tsoungiza: 9-2-8 [13] (Rutter 1989, 9, fig. 6.17), 1410-2-69 [14], 1327-2-97 [15]. Images courtesy of the British School at Athens (Menelaion), Jeremy Rutter (Tsoungiza), and Mitrou Archaeological Project (Mitrou)

Despite formal differences, which mainly involve the placement of the handles and rim profile, the general proportions are quite similar and disclose an important feature: many of the cooking pots from Tsoungiza, Mitrou, or the Menelaion could not stand on their own. This, in turn, points to a particular cooking

method that required some kind of a support for the pot. It appears that they were most likely submerged in a heap of hot embers (Lis 2015, 105). Alternatively, some kind of a support made of stone could be imagined, but no evidence is present to support this notion.

Regarding the composition of the cooking assemblage, tripod cooking pots have a substantial share already by the LH II period at both Mitrou and the Menelaion. While this situation is hardly surprising given the presence of Minoan influence at the Menelaion and other sites of the southern Peloponnese (see Shelmerdine and Gulizio, this volume), it is more difficult to explain the large number of tripods at Mitrou, as this form does not seem to have any local or even regional predecessor. Interestingly, at Mitrou tripod vessels appear in a variety of forms, sizes, and fabrics. I interpret this appearance of a new cooking form as the result of the rise of local elites and their competition for power and prestige in various social arenas, including that of food display and consumption (Lis 2012b; 2015, 109). No such development can be traced at contemporary Tsoungiza, and this is consistent with the lack of strong social differentiation at the site.

Similar differences among the three sites can be postulated with regard to specialized cooking equipment. At the Menelaion, both griddles[5] and souvlaki stands appear already in the Early Mycenaean period (Catling 2009, 429–431), and this seems to be confirmed by the recent evidence from Iklaina (see Shelmerdine and Gulizio, this volume), while outside of the southern Peloponnese they tend to be phenomena of the Palatial period. These shapes are not present at Mitrou, yet other forms, like large lids and basins, dippers, and frying pans suggest that some experimentation with cooking methods took place there in the Early Mycenaean period (Lis 2016).

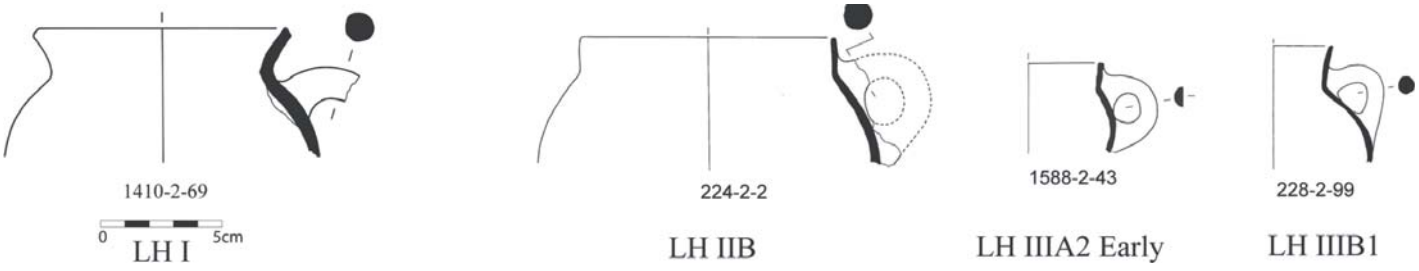


Figure 5.3. Development of a shoulder-handled cooking pot at Tsoungiza. LH I: 1410-2-69; LH IIB: 224-2-2; LH IIIA2 Early: 1588-2-43 (Thomas 2011, 218, fig. 25.280); LH IIIB1: 228-2-99 (Thomas 2005, 519, fig. 30.2). Images courtesy of the Trustees of the American School of Classical Studies at Athens and Nemea Valley Archaeological Project

Palatial period

Cooking pots from the Palatial period at Mitrou and Tsoungiza are characterized by a fair degree of chronological continuity. Rim-handled and shoulder-handled jars respectively develop from their Early Mycenaean prototypes (Fig. 5.4, for Tsoungiza see also Fig. 5.3). At the Menelaion, the situation is far from clear for the earlier part of the Palatial period due to the lack of sizeable deposits, but there are still important new developments. The old form (button-based jug) appears to be replaced by two new forms. The so-called "kitchen beaker" (Catling 2009, 424–425) is probably an indirect continuation of the button-based jug, and while it is poorly attested prior to the LH IIIC period, it cannot be entirely dismissed as an intrusion in the Palatial period deposits. The other new form is a flat-based shoulder-handled jar, which in its upper part is similar to the earlier tripods (Fig. 5.4). Indeed, jars seem to replace tripods, as these become much rarer at the Menelaion. These jars also bear some similarity to forms common at Tsoungiza (Fig. 5.4) and Pylos at the time of the palace's destruction (Shapes 48a.b, Blegen and Rawson 1966, 383–384, figs 371, 372; Lis 2006, 11, fig. 2).

These are interesting observations against the backdrop of Mycenaean decorated pottery and its development. By LH IIIA2, fineware pottery is so homogenous that pottery specialists tend to speak of a Mycenaean *koine* (Mountjoy 1993, 15). There seems to be a similar *koine* in the cooking pottery, but its extent seems much more limited and probably only encompasses the area of the Peloponnese. More data from settlements in Attica and Boeotia are definitely necessary in order to investigate this issue further.

The composition of cooking assemblages is slightly different at each of the three sites. While tripods continue to be used at Mitrou (Lis 2015, 109, fig. 9.5), and enter the repertoire of Tsoungizan cooking pottery in the LH IIIA2 Early period (Thomas 2011), they seem to become much less common at the Menelaion (Catling 2009, 425–426). A similar trend can be seen with respect to specialized cooking equipment. Griddles, already present at the Menelaion in the Early Mycenaean period, are almost entirely gone from the assemblage, while they show up both at Tsoungiza (Thomas 2005, 523–524) and Mitrou for the first time (Lis 2012b). Also souvlaki stands seem to have been more common at the Menelaion in earlier times. They appear at Tsoungiza together with griddles (Thomas 2005, 524), but have not been identified at Mitrou.

There are thus some differences among the sites, especially between Mitrou and Tsoungiza on the one hand and the Menelaion on the other, yet what once again binds all three sites together are the general proportions of cooking pots, which are very different from those of the Early Mycenaean period. Palatial period cooking pots have much wider bases, and their bodies tend to be more globular than before (Fig. 5.4). All of this points to a greater concern with stability and the possible introduction of new ways of cooking. It is plausible to see these cooking pots as being placed at the edge of fixed hearths, as is also indicated by the locations of secondary burning marks on the surfaces (Lis 2015, 105–106, fig. 9.2).

Post-Palatial period

Judging by the seemingly thorough societal change that was brought about by the destruction of the Mycenaean palaces around 1200 BC, one could expect that cooking pots would reflect some of these events and changes, as is the case for the decorated pottery, which undergoes a rather quick process of regionalization initiated already by the LH IIIB2 period (see Sherratt 1980). At Mitrou and the Menelaion some change is noticeable, but it can be summarized as progressive simplification. Just one type of cooking pot dominates the assemblage, the rim-handled jar with a broad base, which had already been present at those sites in Palatial times (Fig. 5.5). Tripods are gone from the assemblage, which constitutes a big change at Mitrou, and only a minor one at the Menelaion. Assemblages at both sites lack specialized cooking equipment. Thus, all aspects of cooking pottery considered here are quite similar at both sites for the first time in the LBA.

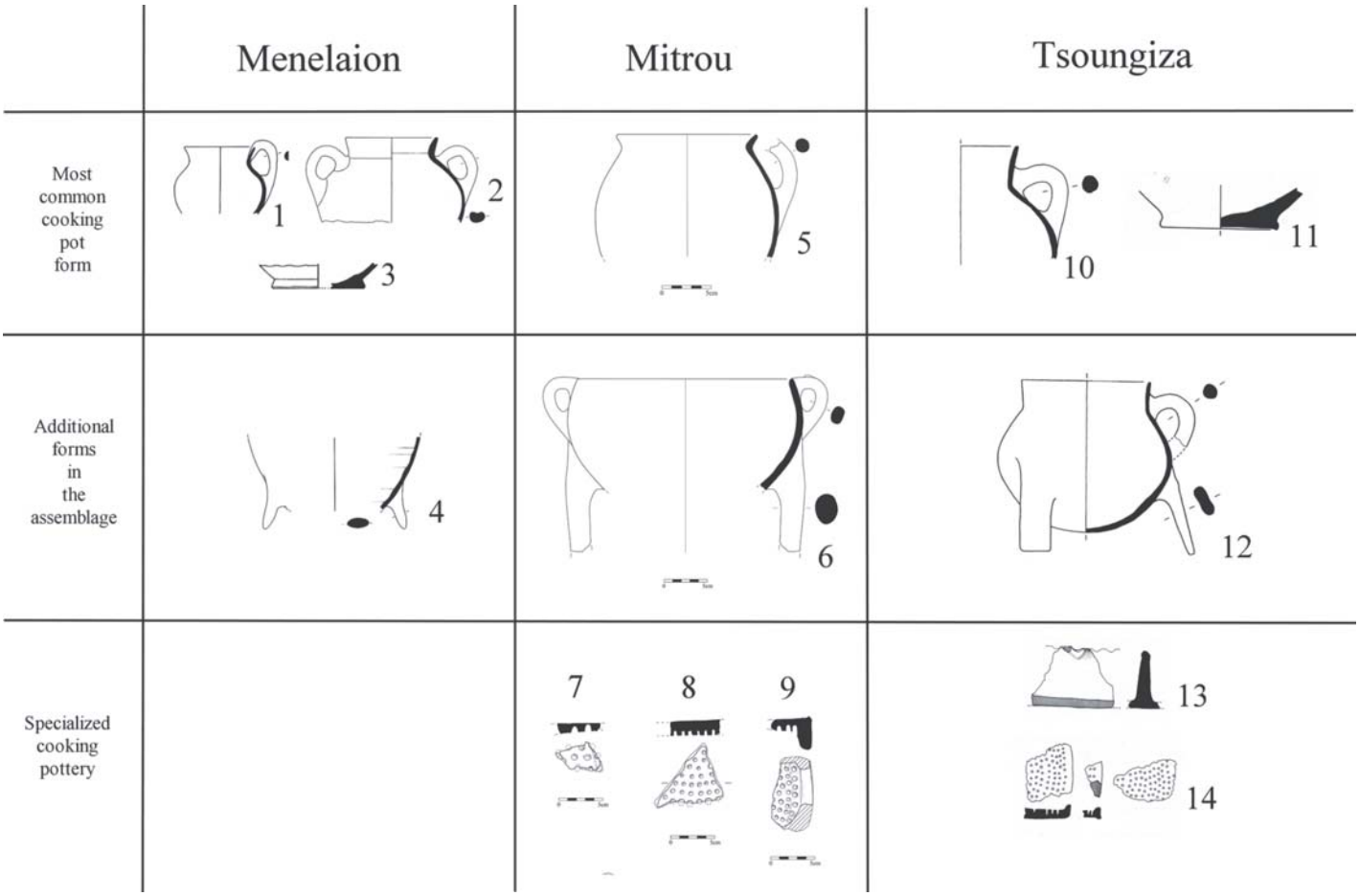


Figure 5.4. Cooking pottery of the Palatial period. Menelaion (from top left): PD190 [1], WE95 [2], WE98 [3], PD183 [4] (Catling 2009, 137, fig. 194; 129, fig. 176; 137, fig. 193); Mitrou: LP782-033-029 [5], LP782-030-018 [6], LG790-016-014 [7], LR782-004-012 [8], LN784-086-013 [9]; Tsoungiza: 228-2-99 [10], 228-2-255 [11], 228-2-235 [12], 209-2-282 [13], 228-2-48 [14] (Thomas 2005, 519, fig. 30.2; 523, fig. 32.11; 521, fig. 31.1; 524, fig. 32.2; 523, fig. 32.1). Images courtesy of the British School at Athens (Menelaion), the Trustees of the American School of Classical Studies at Athens (Tsoungiza), and Mitrou Archaeological Project (Mitrou)

We cannot say anything about Tsoungiza, as the site is uninhabited in the LH IIIC period, yet one can look at another site in the Corinthia, Korakou. This substitution is far from ideal, but it seems plausible that cooking pottery within the same region was similar, since trends observed in this period are consistent with the entire northeast Peloponnese. The change in cooking pottery repertoire, in comparison with the Palatial period, is obvious and profound. The shoulder-handled type of cooking pot, which was the most popular and widespread, especially in the entire northeast Peloponnese, is immediately and thoroughly replaced by the type with either one or two rim handles (Rutter 1974, figs. 33.2, 49.6, 60.1, 90.7). The same thorough change is visible in the Argolid, based on material from Tiryns (Stockhammer 2008, fig 32.831, 832, 838) and Mycenae (French 2011, 339, 391, 410, 412, 520, 522, 524). Prior to the LH IIIC period, the only rim-handled cooking pots were those of Aeginetan origin.[6] Tripods quickly become less common, similar to the fate of other specialized cooking equipment. Thus, after several centuries when regions had quite different cooking pot forms and assemblages, and similarities were few, the Post-Palatial period brings uniformity. Moreover, this development seems to be rather abrupt. The contrast with decorated pottery could not be more acute.

Summary and conclusions

Table 5.1 summarizes similarities and differences among cooking pottery from Mitrou, Tsoungiza, and the Menelaion over the three broad chronological stages analyzed using the four variables taken into consideration throughout this paper. A dark gray background represents dissimilarities, while white stands for similarities. As is clearly visible, there is a shift in time from darker to paler shades of gray, *i.e*. toward greater similarity. Such directionality is understandable for the transition from the Early Mycenaean to the Palatial period, as there is a general trend in the material culture toward greater homogenization. For the fine decorated pottery, the onset of the Palatial period is characterized by great unity over a broad geographical area, a phenomenon summarized as a ceramic *koine*. This is probably an effect of the rise of the palaces and their influence over the sphere of social and economic activity. In particular, their influence on pottery manufacture, food production, and feasting activities must have had a bearing on the way cooking repertoires looked and developed.

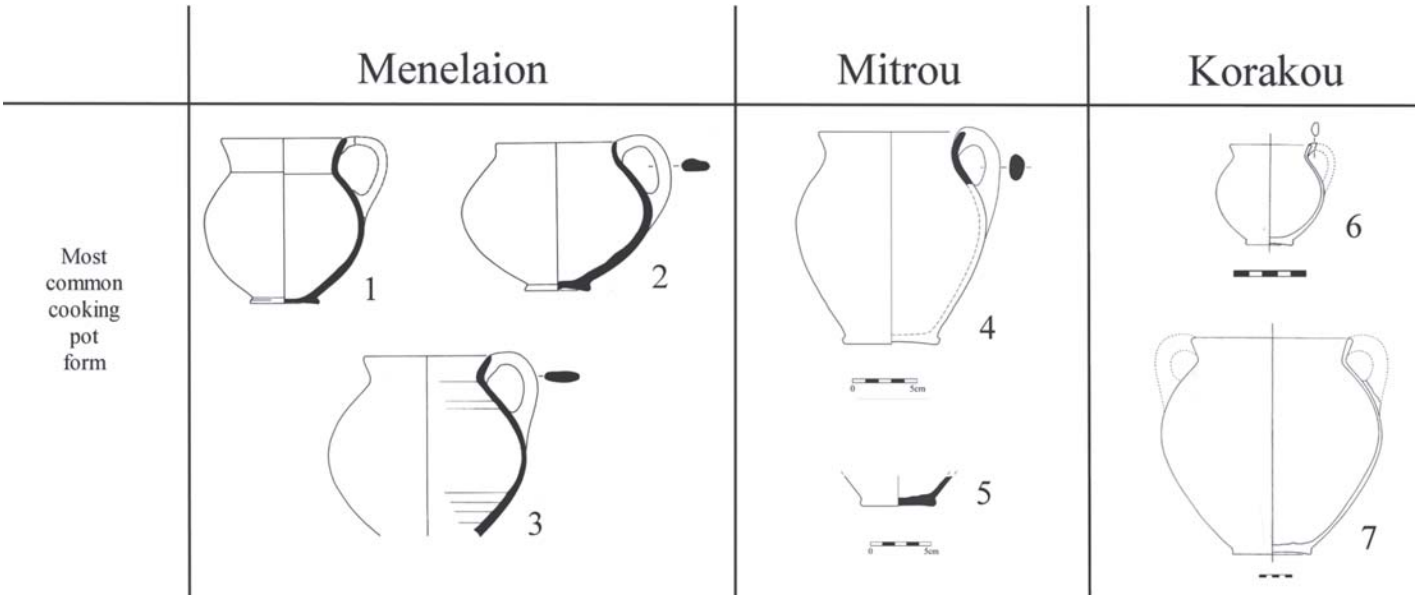


Figure 5.5. Cooking pottery of the Post-Palatial period. Menelaion: AO71 [1], AO72 [2], A432 [3] (Catling 2009, 242, fig. 280; 262, fig. 311); Mitrou: LN784-018-014 [4], LP785-015-016 [5]; Korakou: CP 120 [6]; CP 2756 [7] (Rutter 1974, 236– 237, fig. 90.7; 180–181, fig. 60.1). Images courtesy of the British School at Athens (Menelaion), Jeremy Rutter (Korakou), and Mitrou Archaeological Project (Mitrou)

With the fall of the Mycenaean palaces, one could reasonably expect this trend to be reversed, and cooking pottery to follow the path of the decorated pottery, *i.e*. toward ever-increasing regionalism accompanied by local idiosyncrasies. But on the contrary, the picture displayed here is one of overwhelming uniformity among Post-Palatial cooking pottery. No doubt it is only a general impression, and as one scratches below the surface more differences may appear. But this reservation is valid for all periods analyzed, not only for the Post-Palatial one, and still it is the LH IIIC period that stands out so clearly.

While the mechanisms behind such a change cannot be elaborated fully here, I would like to offer a few thoughts. The similarity of cooking assemblages throughout the mainland is a direct consequence of their simplicity. The vast majority consist of one- and two-handled flat-based cooking jars, with very infrequent exceptions. The lack of any specialized equipment only adds to this austere picture. The disappearance of tripods and other specialized cooking utensils after the fall of palaces might be a sign of a return to simpler ways of life. Their introduction to the assemblage was either an invention of local elites during the Early Mycenaean period (Mitrou), or was linked to the activity and influence of palatial centers later on

(Tsoungiza), as is clear from the distribution of griddles or souvlaki stands. With the events that wiped the palaces off the political and socio-economic scene, the need or desire to use these specialized utensils might simply have ceased. Furthermore, changes in agriculture and subsistence might have eliminated certain dishes or ways of cooking with which these forms had been associated. Finally, conscious rejection of palace-enforced foodways or culinary customs might also have played a role.

Does the simplification of cooking repertoires mean that the elites of the Post-Palatial period did not consider food and cooking a fruitful arena for competition and manipulation? I think they still did, but the ways in which they put such competition into practice changed considerably. I have argued elsewhere (Lis 2015, 108) that the quantity of food served was more important in elite consumption during the LH IIIC period than the variety of food consumed (as suggested by lack of specialized forms). There are buildings on the Mainland (Lefkandi: West House during phase 1b, see Evely 2006, 13–26; Tiryns: Stadt-Nordost during phase 2, see Stockhammer 2008, 187– 188), that contain assemblages of cooking pots with overall capacities far exceeding the needs of even a large family. Such households probably engaged in competitive feasting.

What remains to be discussed is the striking similarity of the basic flat-based cooking pots forms. In addition to the examples that have been already mentioned, one can also find similar vessels at Lefkandi (Evely 2006, 208–209, figs 2.33, 2.34), Athens (Rutter 2003, 207, fig. 7.5; personal examination did not confirm its Aeginetan provenance), and Phylakopi (No. 543: Mountjoy 1985, 206, fig. 5.39). As discussed above, at Mitrou and the Menelaion this can be seen as simple continuity. But for the Argolid and Corinthia, this is a substantial and sudden change in the basic form. It does not seem to have involved a profound alteration in the manner of cooking, which makes it even more difficult to comprehend. I would like to suggest one possible explanation, however. The beginning of the 12th century BC was probably a period of increased human mobility. On a long-distance scale, this is most clearly demonstrable by the increased number of findspots of Handmade Burnished Ware, associated with populations originally from southern Italy (Jung 2006; Lis 2009). Yet this is an extreme case, which was probably accompanied by more limited movements within the Greek mainland that are less visible archaeologically. Surely such phenomena involved women, and this must have brought some changes in the kitchens, not only with regard to the kind of food being prepared or cooking styles, but also preferences for particular types of cooking pots. Moreover, mobility also involved craftsmen, including potters. Studying the production of Aeginetan cooking pots in the later LBA, it was possible to detect the mobility of their producers that commenced immediately after the fall of the Mycenaean palaces (Lis *et al*. 2015). Perhaps it is not a mere coincidence that Aeginetan cooking pots from the Palatial period onwards were rim-handled, just as was virtually every cooking pot of the LH IIIC period? Is it possible that such mobility concerned more potters than just those from Aegina, and the change of cooking pot forms that we see in the Argolid or Corinthia arose from intensified interactions between old and new potters? Or, alternately, was the Aeginetan cooking pot once again a “model” cooking pot that was considered a suitable replacement for the old types? This, as discussed earlier, had happened in the same area already at the beginning of the LBA. These are just hypotheses, and more published material will be necessary before we are able to verify them, but I believe we need to consider such possibilities in order to explain changes in cooking pottery and, more generally, in cuisine.

Table 5.1. Summary of results showing similarities and differences between assemblages at the discussed sites

Site	*LH I-IIIA1*	*LH IIIA2-B*	*LH IIIC*	*Variable*
Menelaion vs. Tsoungiza/ Korakou				Proportions
				Form
				Assemblage
				Special utensils
Tsoungiza/ Korakou vs. Mitrou				Proportions
				Form
				Assemblage
				Special utensils
Mitrou vs. Menelaion				Proportions
				Form
				Assemblage
				Special utensils

similarity
certain similarity
dissimilarity

Notes

1 I would like to thank Aleydis Van de Moortel and Eleni Zachou (Mitrou), James Wright and Mary Dabney (Tsoungiza) for their invitation and encouragement to study cooking pottery from these two important sites. For comprehensive advice on pottery from both Mitrou and Tsoungiza, I am grateful to Jeremy Rutter. Many of my ideas concerning cooking pottery took shape during discussions with Salvatore Vitale, Štěpán Rückl and Pat Thomas. Part of this research was funded through a grant No. NN109 218036 from the Polish Ministry of Science and Higher Education.

2 The results of this study will be published as a part of the monograph on LBA Tsoungiza (Lis in press).

3 For the site of Mitrou, the Early part of LH IIIIA2 is considered the final stage of the Pre-Palatial period (Vitale 2012b, 1148) and hence here it is treated together with other Early Mycenaean material. For Tsoungiza, LH IIIA2 Early is already a period of a strong palatial involvement at the site (Dabney *et al*. 2004).

4 For cooking pottery from Tsoungiza, I owe this idea to Jeremy Rutter.

5 Griddles illustrated in Figures 5.3 and 5.4 follow the orientation as in the original publication (the Menelaion, Tsoungiza) or that preferred by the author (Mitrou). See also Shelmerdine and Gulizio, and Hruby, this volume.

6 The presence of non-Aeginetan rim-handled cooking pots in the Argolid or Corinthia may be in fact a useful diagnostic for the differentiation of the LH IIIC versus LH IIIB2 pottery assemblages.

6

Aeginetan Late Bronze and Early Iron Age cooking pottery

Walter Gauss, Evangelia Kiriatzi, Michael Lindblom, Bartłomiej Lis, and Jerolyn E. Morrison

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Introduction[1]

Interdisciplinary investigations for the past three decades have profoundly altered our understanding of the different potting traditions that centered at Kolonna on Aegina in the Saronic Gulf. The local manufacture of a range of different containers was staggering in terms of quantities and remarkable in its longevity (Lindblom 2001; Gauss and Kiriatzi 2011; Klebinder-Gauss 2012; Gauss *et al*. 2015). While most studies have been devoted to ceramic materials from the Early Helladic (EH) II to Late Helladic (LH) I (Lindblom 2001; Berger 2004; Gauss and Kiriatzi 2011) and the Archaic to Classical periods (Klebinder-Gauss 2012), our knowledge about Aeginetan pottery production during the LH II–III and Early Iron Age (EIA) has remained blurred due to the fact that very few well-dated deposits of those periods from Kolonna have been uncovered and published. However, recent work carried out both on Aegina (Gauss 2007; Gauss *et al*. 2015) and outside the island (Stockhammer 2008; Marabea 2010; Lis 2012a; Gilstrap 2014) provides ample evidence for the continuity of production and for the wide distribution of Aeginetan pottery across the central Aegean during that time. In particular, the production of cooking vessels appears to have outlived other classes, and they were still widely traded as late as LH IIIC Early. There is even meager evidence for the exchange of Aeginetan cooking pottery during the EIA. Consequently, the "Aeginetan Cooking Ware Project," carried out by the authors of this article, aims to fill the existing gap by focusing on the production and circulation of Aeginetan cooking pots during the LH and EIA periods. Material for our research derives from the probable production center at Kolonna, as well as four other settlements in different regions of Greece. The study is based on a detailed macroscopic study of the pottery, followed by representative sampling and petrographic analysis, combining a traditional typo-chronological approach and analysis of distribution and consumption patterns.

The main focus of the project is the detailed characterization of the fabric(s) and manufacturing

technology of "Aeginetan cooking ware" during the LH and EIA periods (for Kolonna see Gauss and Kiriatzi 2011; for Mitrou see Lis 2012a). The following questions are of particular importance:

- Is there continuity in the use of raw materials and technology from the Middle Helladic (MH) to the LH and EIA periods?
- Is it possible to isolate fabric subgroups within the broad group of LH/EIA Aeginetan cooking pottery?
- If so, do these subgroups reflect changes over time, across space, in workshop traditions, or a combination of these factors?

We also aim to characterize the diachronic development of Aeginetan cooking pottery in its other aspects, such as morphology, marking system, distribution, and consumption patterns. Since the petrographic analysis is in a preliminary stage, the present paper focuses primarily on the issues mentioned above, while reporting only briefly on the first results of petrographic analysis.

Settlements and materials

The in-depth study of the cooking pots at Kolonna rests at the core of the current project since the site is associated with the assumed production area. In addition, comparative studies and sampling were carried out at four other settlements where "Aeginetan cooking pots" have been identified macroscopically in deposits dated from the late MH II to the end of the LH period. The settlements are Mitrou in East Lokris, Asine in the Argolid, Tsoungiza in the Corinthia, and Kalaureia-Poros in the Saronic Gulf (Fig. 6.1). In all cases, the detailed macroscopic examination of the pottery was followed by the selection of representative samples.

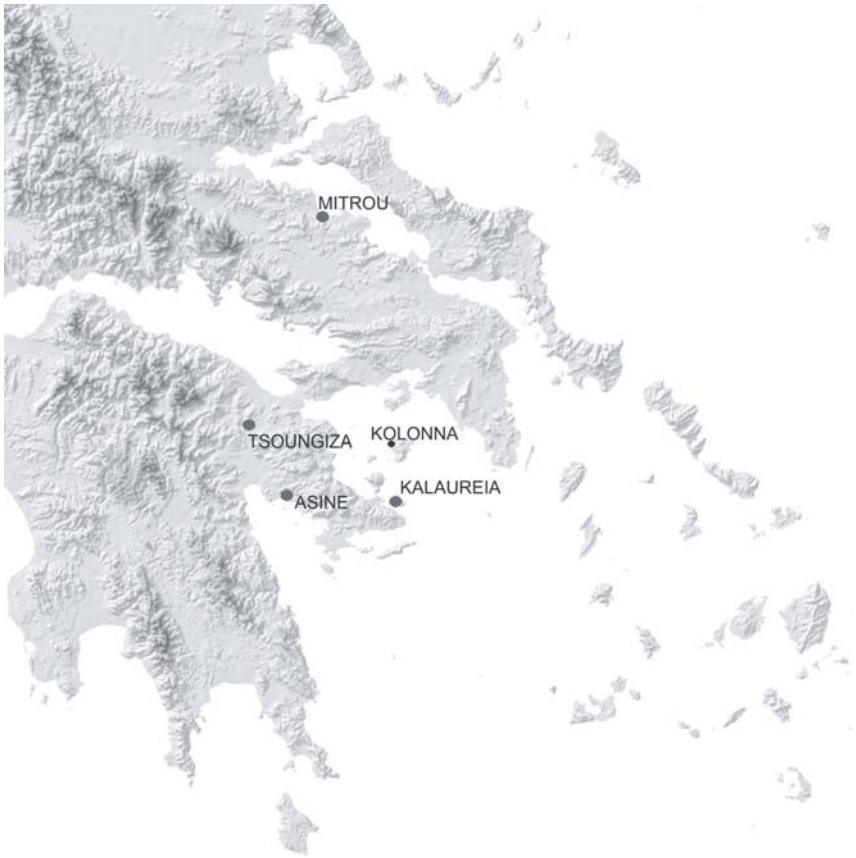


Figure 6.1. Map of Greece (© Anavasis) with sites included in the project

A total of 226 vessel fragments have been sampled from the five settlements mentioned above. As many as 84 new samples derive from Kolonna, representing an addition to the 266 samples of predominantly EH and MH date analyzed before (Gauss and Kiriatzi 2011) and the 140 samples of Archaic and Classical date (Pentedeka *et al*. 2012). The new samples cover a broad chronological range, from MH II to LH IIIA. An additional 49 LH vessel fragments were sampled from Mitrou, a settlement with an uninterrupted stratigraphic sequence from EH II to Late Protogeometric (Van de Moortel and Zachou 2012). Aeginetan cooking pottery is sparsely present in the MH layers, while large quantities were uncovered from a number of deposits spanning the entire LH period (Lis 2012a), and even the Middle to Late Protogeometric period, as one cooking pot from a Middle to Late Protogeometric floor deposit was identified as an Aeginetan import.

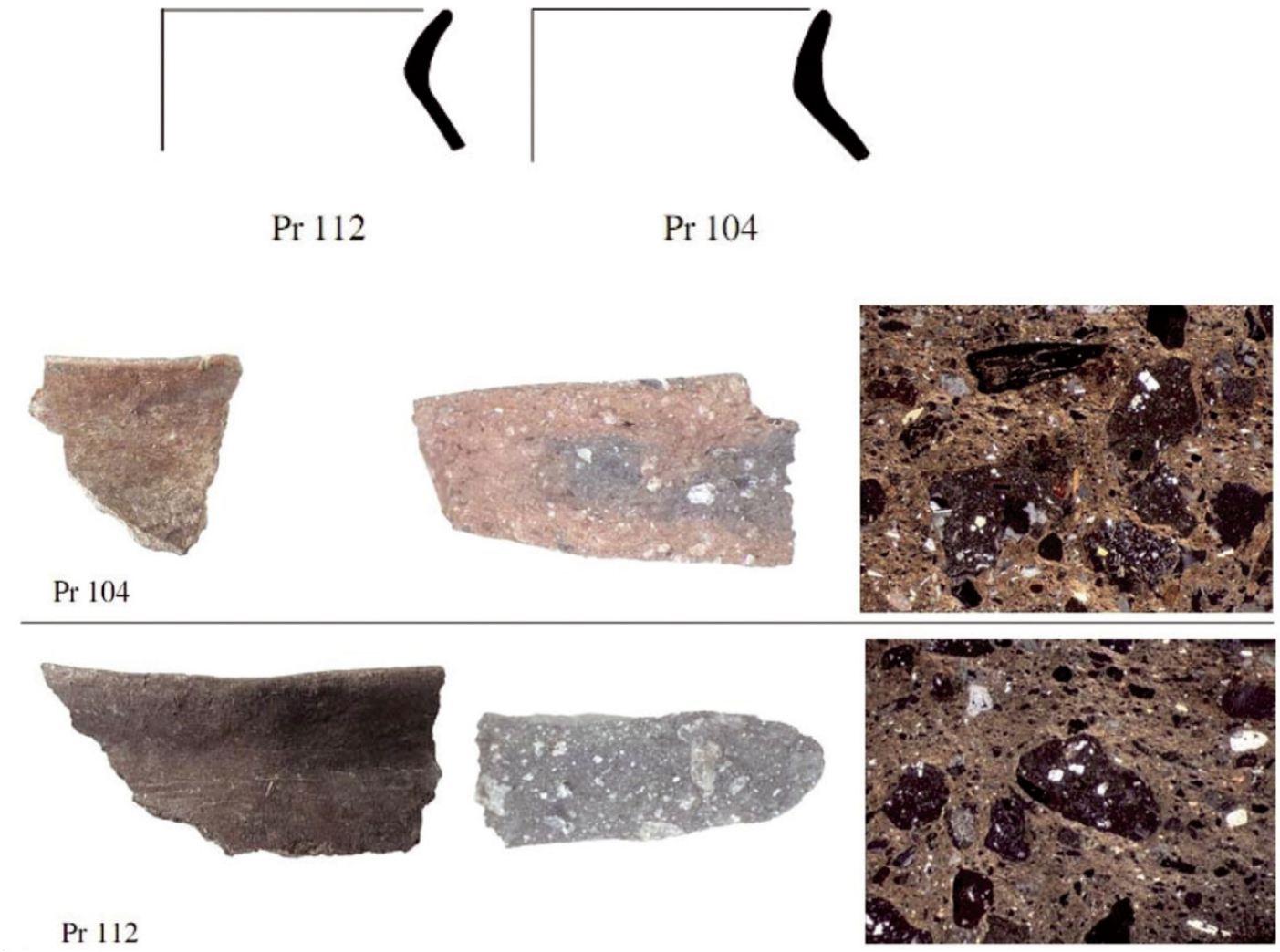


Figure 6.2. Forms of EH III cooking pots – samples KOL104, KOL112 (sherds 1:2, close up macros 4:1, fabric photomicrographs, XPL, fov 5.9mm)

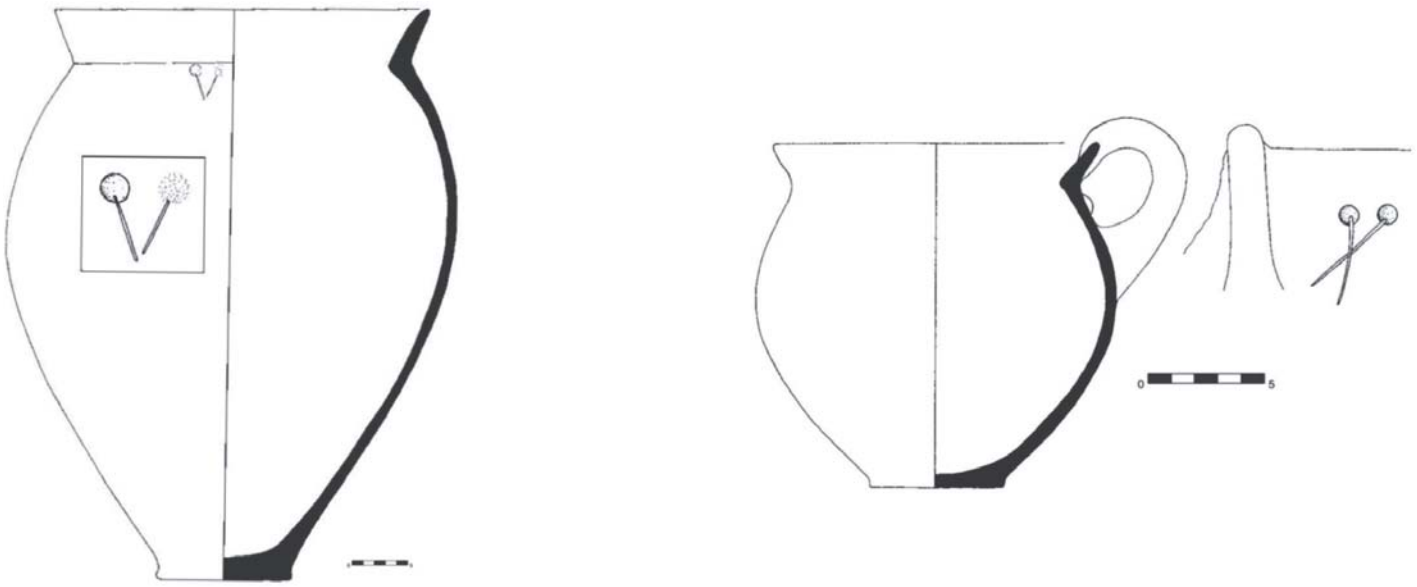


Figure 6.3. Forms of MH I–II cooking pots

Moreover, material excavated in 1926 at Asine (Frödin and Persson 1938) and presently stored in new facilities in Uppsala was the source of 50 additional samples. They range in date from MH III to LH III, including a number of fragments bearing the same potter's mark. A selection of 33 samples from Tsoungiza covers the entire Late Bronze Age sequence at the settlement, from LH I to LH IIIB1. Particularly valuable are fragments deriving from the LH IIIB1 period (Thomas 2005), as material of this date has yet to be published from any other site. The last stage of the production and export of Aeginetan cooking pottery in the LH period is represented by ten LH IIIC Early samples from the small Mycenaean settlement located within the later sanctuary of Poseidon on Kalaureia (Wells *et al*. 2003, 41–49; Lindblom *et al*. in press).

Diachronic analysis of Aeginetan cooking pottery

Morphology, marking system, distribution and consumption

The development of Aeginetan cooking vessels during the Bronze Age can be divided into four broad chronological phases: (1) EH III, (2) MH I–II, (3) MH III–LH IIIA1, and (4) LH IIIA2–LH IIIC. Although we focus on the LH and EIA periods, we will provide a brief discussion of the entire development.

Because of the small quantity of material, relatively little can be said about the shapes in the first phase, the EH III period (Gauss and Kiriatzi 2011, 172–173). Only the upper bodies with everted, internally slightly convex rims can be illustrated as examples (Fig. 6.2). In the second phase, during the MH I–II period, cooking vessels are characterized by two forms: a large handless jar, and a small jug with a high-swung handle and a flat or slightly raised base (Fig. 6.3). The flat bases are sometimes trimmed at the junction to the lower body. Occasionally, there is a layer of sand grains visible on the bottom of the base, most probably to help the potter removing the pot from the surface where it was manufactured and move it during the drying phase. Their rims are quite similar to those described for the EH III period. In this phase, potters distinguished cooking pots from other classes of vessels by marking them on the shoulders rather than below or around the base (Lindblom 2001, 112).

A previously unknown group of cooking pots dating to the MH II period deserves a separate mention (for their general context, see Gauss 2006; 2010), even though Aeginetan cooking pottery from these phases was characterized during a previous project by Walter Gauss and Evangelia Kiriatzi (2011). As demonstrated

by macroscopic and petrographic analysis, these pots were manufactured on Aegina, yet their morphology and manufacture points to Crete. These locally produced Minoanizing cooking pots include tripod jars and tripod trays (Fig. 6.4). In contrast to the traditional Aeginetan pottery production, such Minoanizing pottery never bears potmarks. Unlike other Minoanizing vessels at Kolonna, these cooking vessels are handmade (similarly to analogous pottery on contemporary Kythera and Crete). All evidence points to the appearance of a foreign technological tradition, most probably transferred to Aegina by mobile or relocated Cretan potters (for a discussion of the broader phenomenon concerning mostly the southwest Aegean, but including also Aegina, see Kiriatzi 2010). There seems to be very little evidence for cross-fertilization between the two potting traditions, and the Minoanizing or Cretan one seems to have disappeared after a few generations at the end of the MH II period (Lindblom *et al*. 2015). Among the Minoanizing vessel shapes produced for a relatively brief period at MH II Kolonna, only the tripod finds its way into the local ceramic repertoire. It comprises the only morphological feature of the Crete-related tradition that was adopted and appropriated by the local Aeginetan potting tradition and continued to be manufactured for some generations (see below).

Toward the end of the MH period a new type of cooking pot was introduced. A shoulder-handled jug (invariably with one vertical loop handle) with a long everted rim and a well-defined raised or splaying base marks the beginning of the third phase of development (Fig. 6.5 left). Additionally, potters' marks on cooking pots are now placed on the base or, less frequently, at the base of the lower handle attachment rather than on the shoulder, which represents a radical change in the marking behavior (Lindblom 2001, 116). Most importantly, cooking pots are now marked in a manner similar, though not identical, to the other classes of Aeginetan pottery. During this phase, tripods and lids complement the repertoire of cooking vessels (Fig. 6.5 right) but are exported in low quantities.

This phase lasts until the beginning of the LH IIIA2 period and is represented by a number of fragments from Mitrou, Asine, and Tsoungiza, well documenting the distribution and consumption over the entire duration of this phase. Material from Kolonna provides interesting insights into the production of cooking pottery during two particular stages of this phase, LH I and LH IIIA. Although elsewhere Aeginetan tripods are rather rare during most of this phase and become more common toward its end, *i.e*. LH IIB and LH IIIA1, a recently discovered LH I deposit from Kolonna (Gauss and Smetana 2007; Felten *et al*. 2009, 104–105) provides ample evidence for this form (Fig. 6.6). At least three fairly complete examples have been uncovered, all of them small, but slightly different from each other in morphology. Their bases are notable; apart from the flat type, which is usual for this phase, there is also a rounded base, not attested anywhere else prior to the beginning of the next stage, that is, the LH IIIA2 period. Other early examples that document this fusion of the Minoanizing tripod into the local repertoire of shapes are found at MH III Tsoungiza and LH I Lerna (Rutter 1990, 418 no. 171, 450 fig. 18; Lindblom 2007, 127 fig. 10 lower right, and Fig. 6.5 here).

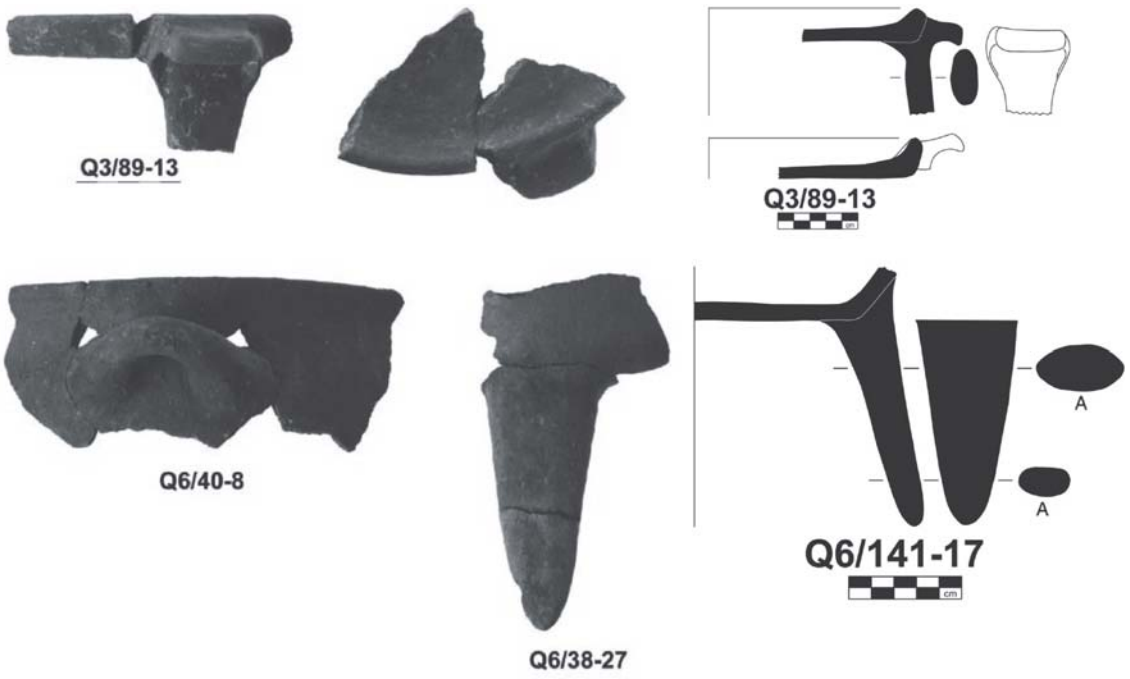


Figure 6.4. Forms of locally produced Minoanizing cooking pottery

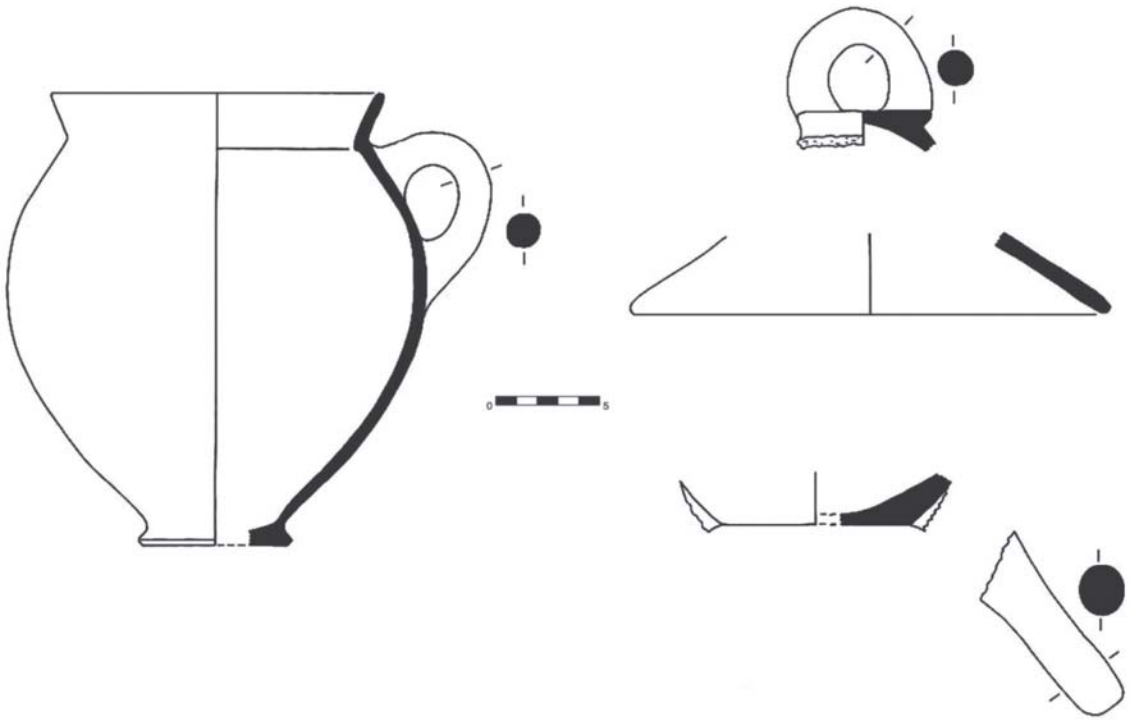


Figure 6.5. Forms of cooking pots produced during the MH III–LH IIIA1 period

The most acute problem in tracing the development of Aeginetan pottery in more advanced stages of the LH period is the fact that Kolonna generally lacks contexts post-dating LH IIA. However, there is one notable exception, a LH IIIA kiln (Gauss 2007; Felten *et al*. 2008, 73–75) and the fill in front of it that accumulated while the kiln was in use, as well as the fill inside the kiln, that was deposited after it went out of use. This assemblage contains a number of Aeginetan cooking pots, in particular medium-sized jugs and numerous tripod feet (Fig. 6.7). These vessels are similar to other cooking pots of this long phase of development, but

there are some interesting new features that set them apart. Most bases are narrow (some straight-sided) and feature a slight hollow on the underside. This type of base is attested only in chronologically similar deposits from the Acropolis South Slope wells in Athens (for an example of a securely identified Aeginetan import see Mountjoy 1981, 22 no. 29, pl. 7a, fig. 6.29), providing indirect evidence for the rarity of Aeginetan exports at this time. A fair number of tripod legs found within the kiln area attest to their growing popularity, and this may be a first sign of changes that will mark the next, and final, phase of development. Slight morphological novelties, such as a more oval section of some of the tripod legs and placement of some handles closer to the rim, also seem to look more toward the final phase of Aeginetan cooking pottery development.

This last phase, spanning the LH IIIA2 to LH IIIC Early periods, is characterized predominantly by two-handled jars and one- and two-handled tripod cooking pots (Fig. 6.8). Their morphology is quite different from the preceding stage, which is most visible in the placement of handles (at the rim) and overall proportions. During this phase, the traditional Aeginetan ceramic industry seems to produce and export exclusively coarse wares, including predominantly cooking pots but also other forms, such as tubs at Kontopigado-Alimos (Gilstrap 2014), lids and pithoid jars at Kanakia (Marabea 2010), and Agios Konstantinos, pithoi (Kalaureia-Poros, Fig. 6.10), as well as basins, kraters and braziers in Mitrou (Fig. 6.9). The fabric of pithoid jars and tubs at Kontopigado-Alimos is similar, but not identical, to that used for cooking pottery, as it contains traces of organic tempering material (Gilstrap 2014, 36). Furthermore, standard Mycenaean wheelmade pottery is also produced on the island, but most probably in different workshops (Gauss and Kiriatzi 2011, 253–254; Gilstrap 2014). The potmarks on cooking pottery are now placed below the handles rather than at the base and are much rarer than in the preceding phase. They are small and consist of combinations of impressed dots or wedges (Lindblom 2001, 117). All the above point to a thorough change in the production sphere, yet, as the evidence of the Kolonna kiln suggests, we should think of it as a gradual one.

Deposits from the small LH IIIC Early settlement within the later sanctuary of Poseidon on Kalaureia (Fig. 6.10) document what is probably the final episode of the long-lasting Bronze Age cooking pot production. Apart from the presence of carinated tripods, apparently the very latest addition to the Aeginetan repertoire, there are also pithoi manufactured in the same Aeginetan fabric as the cooking pots. The settlements at Kanakia on Salamis and Ayios Konstantinos on Methana produced another unique Aeginetan vessel type – a tub – strongly suggesting that places located close to Aegina received a wider array of vessels than those further away like Mitrou or Tsoungiza.

At the current stage of research, it is rather difficult to close the "EIA gap," *i.e*. the long stretch of time between the LH IIIC Early and Archaic period. However, the site of Mitrou provides a vessel that seems to be a first piece of the puzzle. A Middle/Late Protogeometric floor deposit yielded part of a peculiar thick-walled vessel that seems to be ovoid in form (Fig. 6.11). Burning marks identify it as a cooking pot, while macroscopic and petrographic fabric analysis suggest an Aeginetan provenance. So far this piece remains unique.

Petrographic fabric analysis

Let us now turn to the petrographic analysis, which shows that the fabric of Aeginetan cooking pots can be briefly described as a non-calcareous red-firing fabric containing fragments of intermediate volcanic rocks, mostly andesite to dacite, with plagioclase feldspar, biotite, amphibole, and pyroxene (*cf*. Fabric Group [FG] 1 in Kiriatzi *et al*. 2011, 93–99). Two main varieties have been identified so far: FG 1A with inclusions of volcanic rocks containing predominantly brown amphibole, and FG 1B with similar inclusions containing predominantly green amphibole. During the geological mapping of the island, Dietrich and his collaborators (1991) identified distinct types of dacitic and andesitic lavas containing green and brown amphibole and

characterized them as products of different phases of volcanic activity on Aegina. Based on this, the identification of analogous ceramic fabrics has been considered to potentially signify the use of spatially distinct clay sources (Kiriatzi *et al*. 2011, 131–139). As established by Gauss and Kiriatzi (2011), the brown amphibole version of this fabric (FG 1A) was the typical fabric for Aeginetan cooking pots throughout the MBA and early LBA. It is possible that this fabric was introduced first for the manufacture of cooking pots in EH III, although the number of closed deposits dated to this period, and consequently the number of analyzed samples, is small. During the EH III period, however, the green amphibole variety (FG 1B) was the typical fabric for the rest of the unpainted coarse ware, but its use was discontinued after the end of the period (Gauss and Kiriatzi 2011, 169–173). Current evidence suggests that a similar fabric containing predominantly green amphibole (FG 1B), which was not used after the EH III period, reappeared during the LH period. Such fabric composition is characteristic for some LH I–III samples from Mitrou as well as for some of the LH IIIA samples from the potter's kiln at Kolonna and some of the LH IIIC Early fragments from Kalaureia, while the samples from Asine, dated mainly to the MH III–LH I periods, are associated with the brown amphibole variety FG 1A (Fig. 6.12). Moreover, other varieties of non-calcareous volcanic fabrics have been attested among the Aeginetan cooking pots at the above sites, such as ones poor in amphibole but richer in pyroxene, indicating overall higher fabric variability in relation to the samples so far analyzed from the MH period. The variation concerns mainly the granulometry/texture and composition of the volcanic rock inclusions, which range from intermediate to basic volcanic rocks (from dacite or andesite to basaltic andesite or even basalt), all compatible with the geology of Aegina.

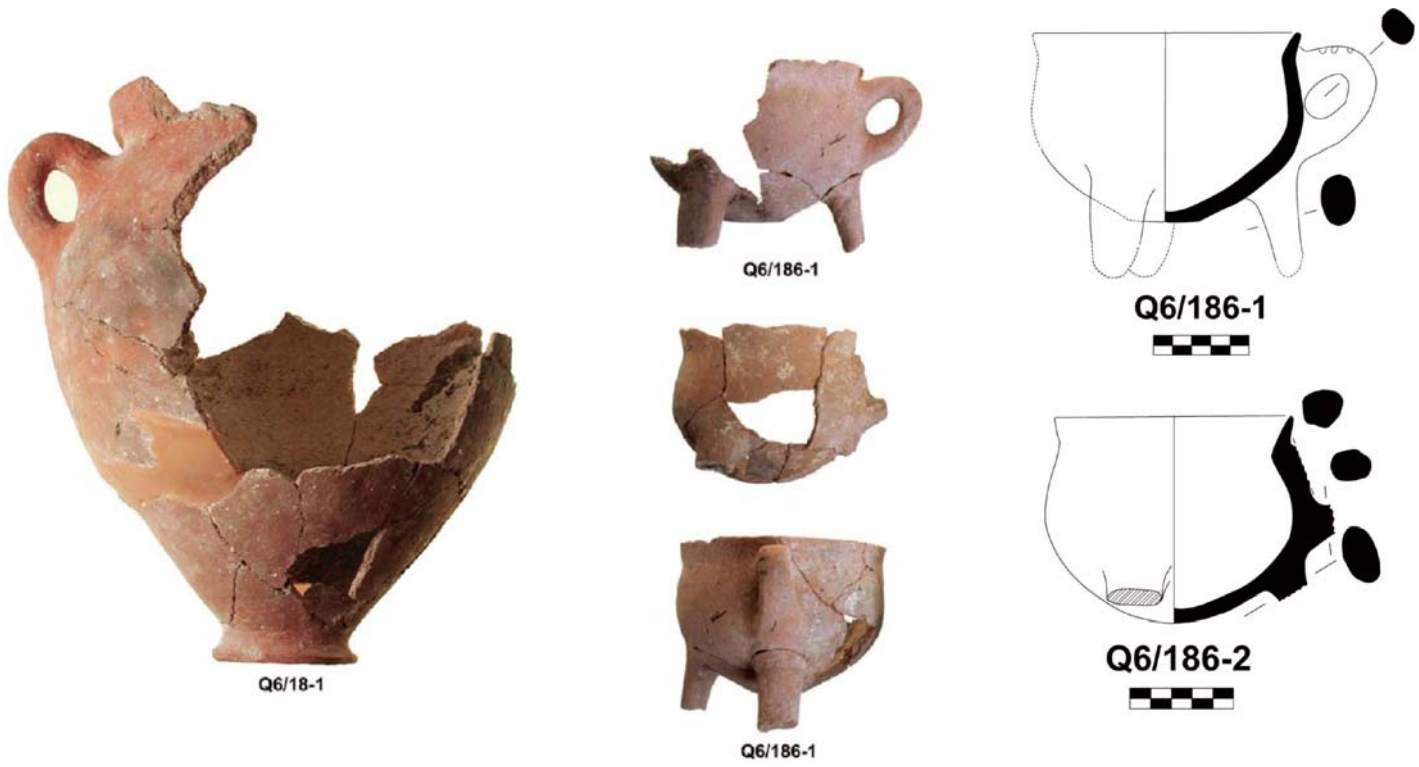


Figure 6.6. LH I tripods from Kolonna

Figure 6.7. Finds from the LH IIIA kiln

One could assume that this increased fabric variability during the LH period, evident even across samples dated more narrowly (*e.g.* the LH IIIC Early samples from Kalaureia-Poros), may suggest less standardization in the raw material sources used, as well as in the processing of raw materials. This relative lack of standardization could have been introduced by a larger number of active production units, a suggestion which is consistent with the evidence of potters' marks, potentially reflecting a substantial number of individual producers sharing facilities, in particular kilns (Lindblom 2001, 121–133). Furthermore, the first analysis of sherds from Asine (Fig. 6.13) indicates a closer compositional association of those samples having potters' marks (usually including similar types of volcanic rocks containing brown amphibole, as well as more frequent carbonate inclusions) when compared to those not bearing potters' marks. This seems to confirm the use of potters' marks by manufacturers working closely together and using the same type of recipes and raw materials, while, possibly, firing their pots in the same kiln batches. Interestingly, potters' marks from Asine were all closely related, belonging to Lindblom's types C1–C3 (Lindblom 2001, 49, fig.

14).

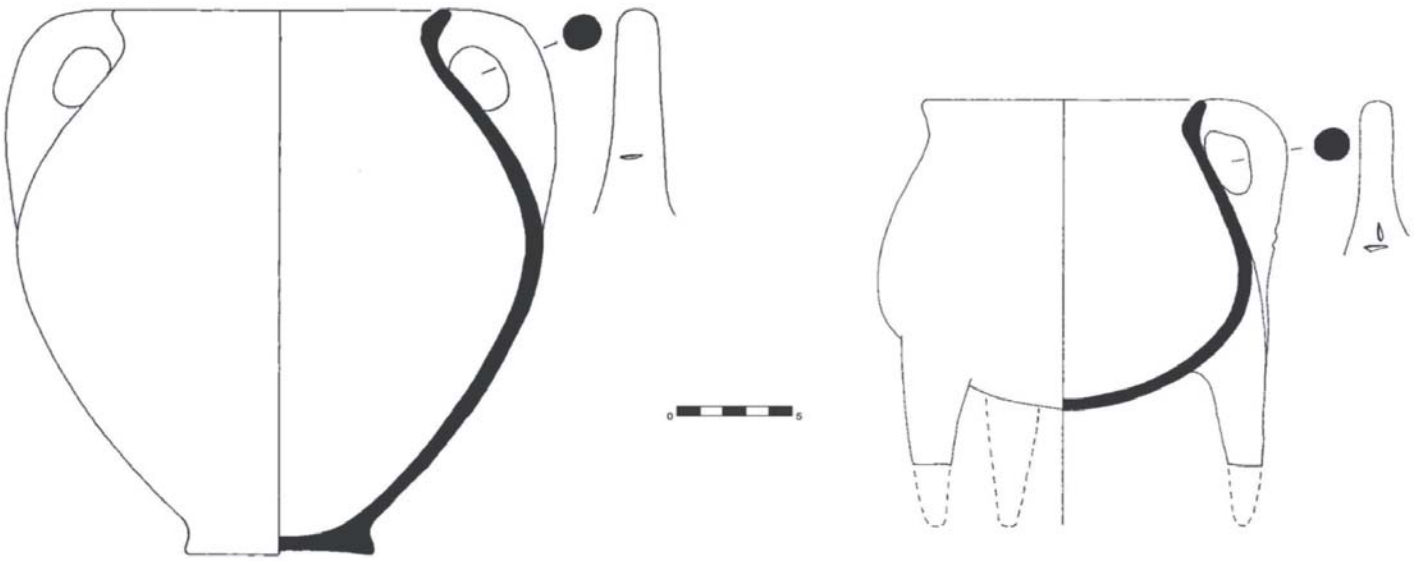


Figure 6.8. Forms characteristic for the LH IIIA2–LH IIIC Early period

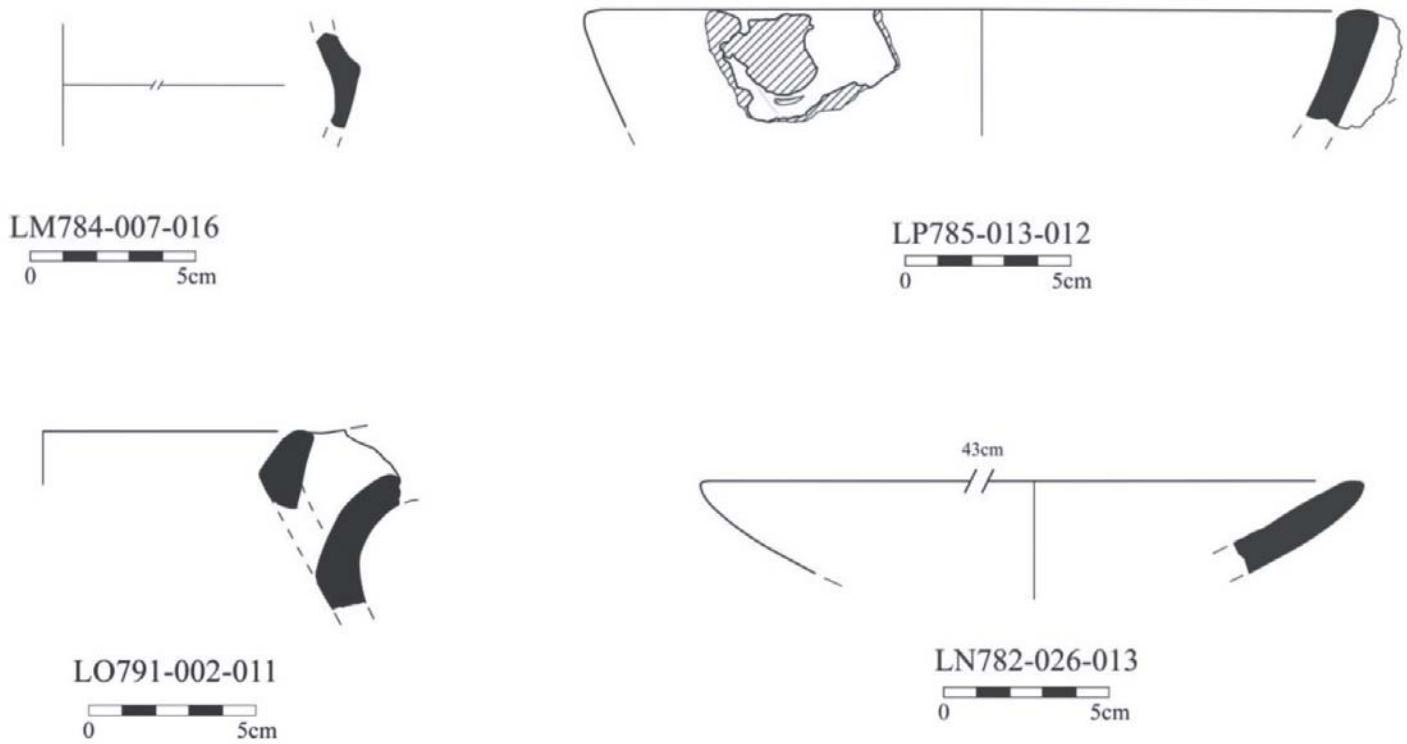


Figure 6.9. Rare Aeginetan forms from Mitrou, courtesy of Mitrou Archaeological Project

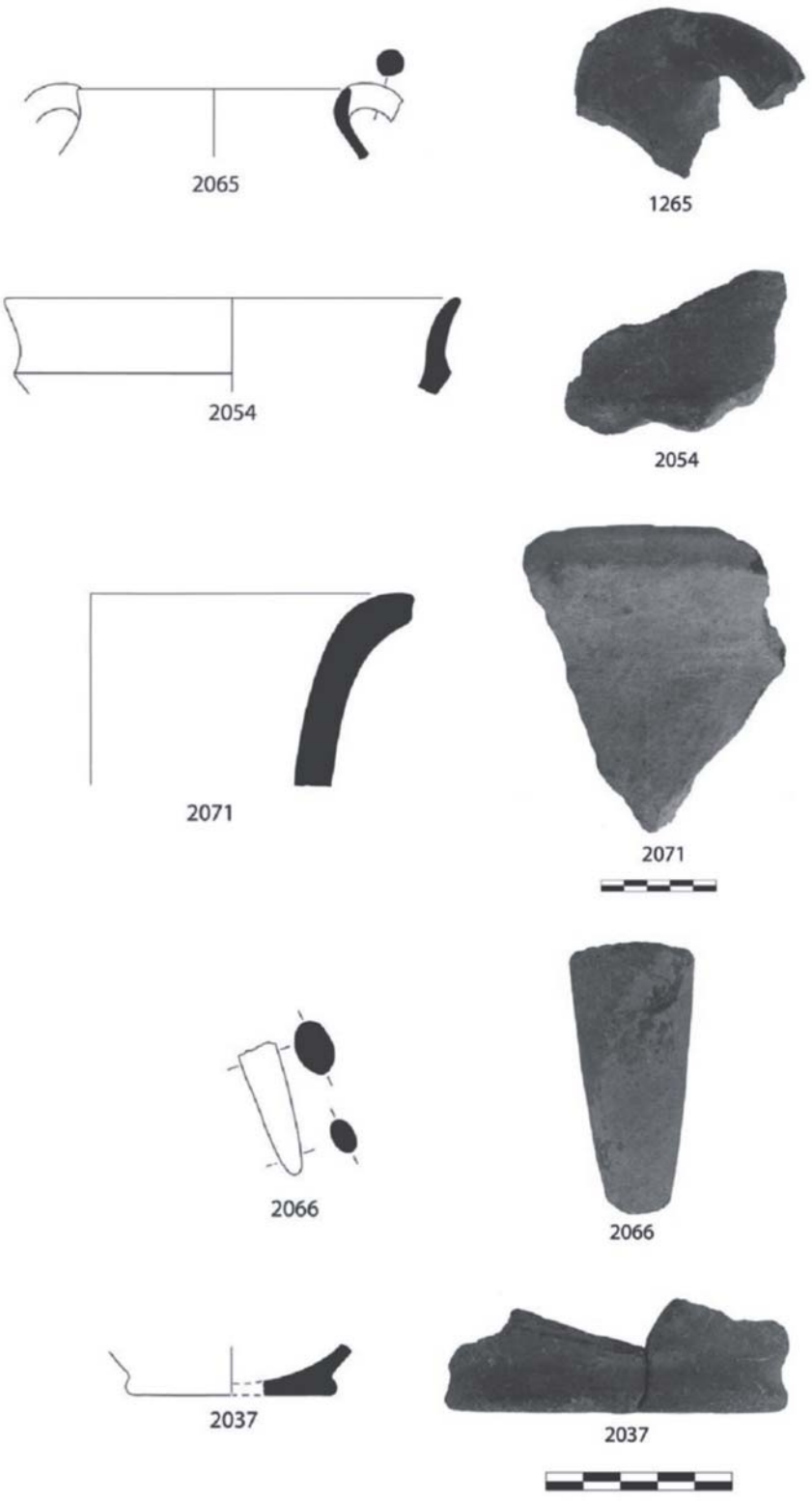


Figure 6.10. Forms represented at Kalaureia, Poros

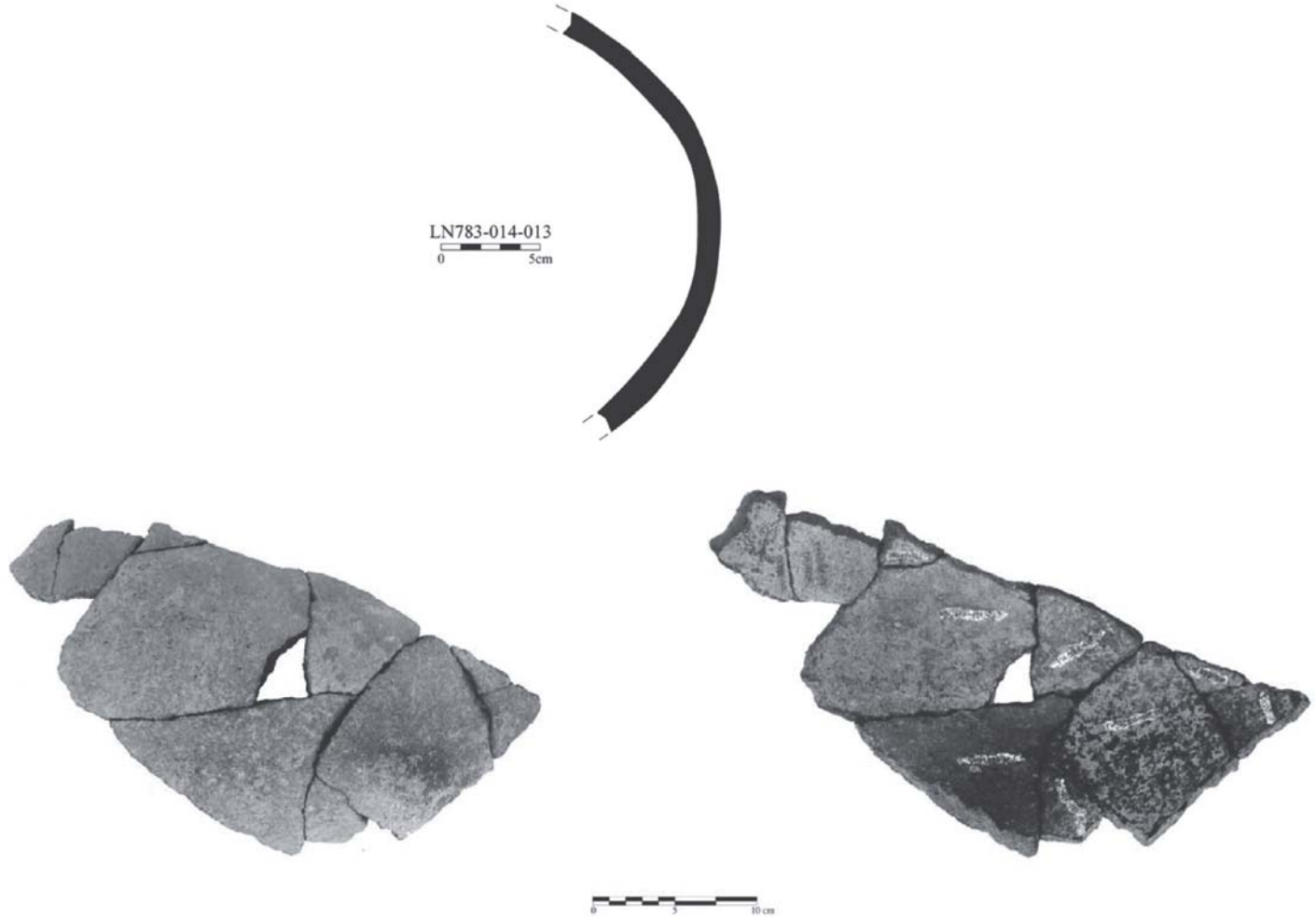


Figure 6.11. Protogeometric vessel from Mitrou, courtesy of Mitrou Archaeological Project

At present, this possible shift concerning the use of a larger number of raw material sources cannot be more precisely dated, and it does not seem to be perfectly correlated with the major change in the production of cooking pots around LH IIIA2, but as discussed above, the LH IIIA fragments from Kolonna display features that are typical of cooking pots characteristic of the last stage of development, very likely indicating a gradual transformation in the potting industry of Aeginetan kitchen wares.

Finally, a very small number of samples, morphologically identical to Aeginetan cooking pots, proved incompatible with the geology of Aegina. The samples include a carinated tripod from Kalaureia-Poros and a piece from Asine. Two explanations can be offered for such fragments: either they represent visual imitations of the popular (Aeginetan-style) cooking pots, or they are products of itinerant Aeginetan potters using local raw materials (see Lis *et al*. 2015). More study, especially concerning the manufacturing technology of such "Aeginetanizing" cooking pots, is needed to test these hypotheses.

Final remarks

This brief report on the "Aeginetan Cooking Ware project" does not provide definitive answers to many of the questions we raised at the beginning of our research. Furthermore, the preliminary findings have substantially inflated the number of issues we would like to investigate. This is a sign of the potential of the project, and we are looking forward to future results, in particular those resulting from detailed petrographic analysis of all 226 samples.

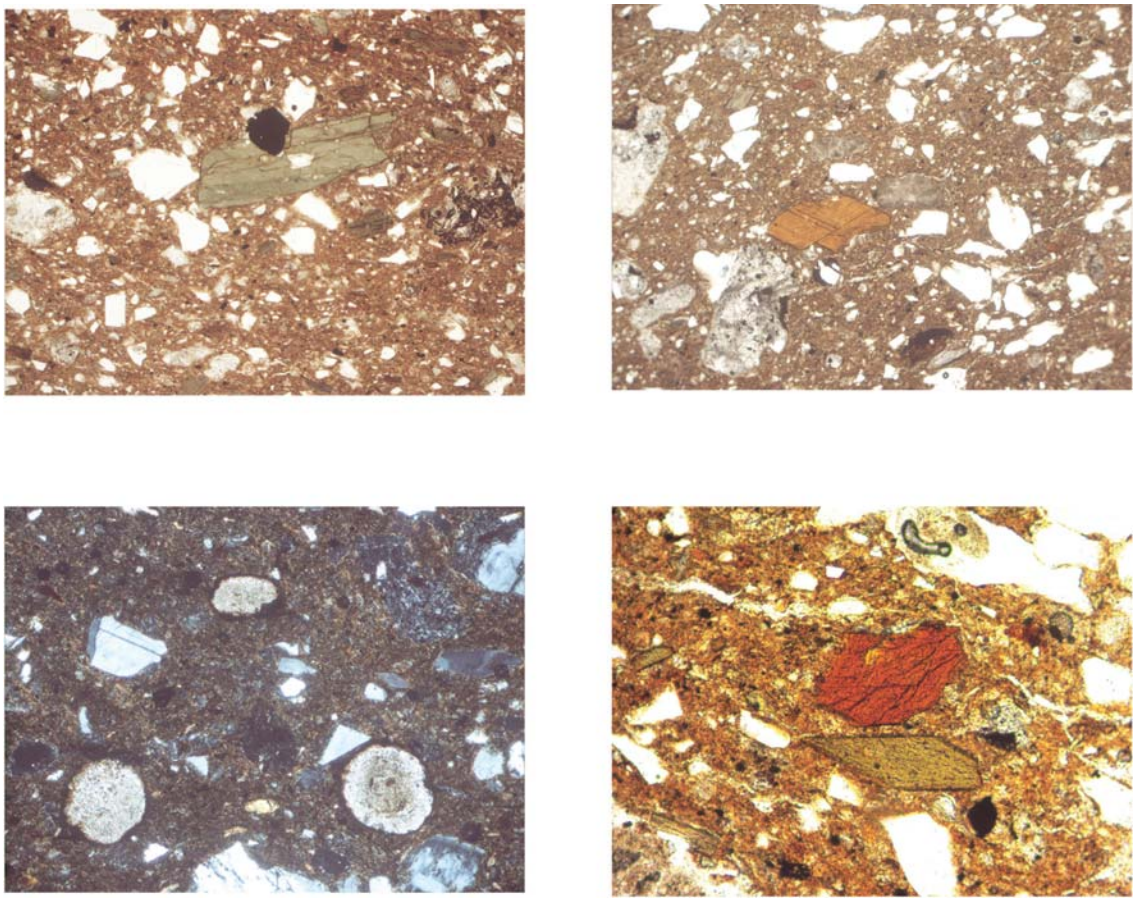


Figure 6.12. Photomicrographs of Aeginetan cooking pot samples from Kolonna and Mitrou. Top row: left, sample KOL172 containing green amphibole (FG1B) and on the right, sample KOL313 containing brown amphibole (FG1A) (PPL, field of view 2.8mm). Bottom row: left, sample KOL298 containing calcareous nodules (FG1A); right, sample MIT_87, LH I/IIA, containing mainly brown and occasionally green amphibole (FG1A) (XP, field of view 0.76mm)

Figure 6.13. Fragments from Asine with similar potmarks

Note

1 The results presented here are the product of a long collaboration between the authors. Without the kind permission of the Greek Antiquities Service and the local Ephorates to study and sample ceramic material, as well as the financial support of the Institute for Aegean Prehistory, this project would never have been accomplished. We are also indebted to our home institutions, the Austrian Archaeological Institute at the Austrian Academy of Sciences, the British School at Athens, the Museum Gustavianum at Uppsala University, the Polish Academy of Sciences, and the University of Leicester for their support.

7

Aegean fusion cuisine: Ayia Irini, Kea as cultural "middle ground"

Evi Gorogianni, Natalie Abell, and Jill Hilditch

Introduction[1]

It is perhaps a truism that food is strongly connected to cultural identity. Cuisine may be more resilient in certain situations than language itself; recipes for chicken cacciatore or spanakopita seem to feature in feast menus for generations after the first migration (Villing and Spataro 2015, 13–14; see also Hayes 1997; Kyriakopoulos 2015), whereas language is lost within one or two (Rumbaut *et al*. 2006). What and how food is consumed, how it is harvested or procured, how it is prepared, and what vessels are used in its preparation, especially in contact situations, are imbued with meaning and become signifiers that serve to distinguish groups, and separate "us" from "others" (*e.g*. Hastorf 1998; Hamilakis 1999; Auberger 2010, 211–226).

Given this connection between cultural or ethnic identity and food, it is unsurprising that cooking vessels have been considered as key evidence for detecting migrants archaeologically (*e.g*. Carington Smith 2000; Yasur-Landau 2006a; Joyner 2007; Ben-Shlomo *et al*. 2008; Boileau *et al*. 2010; Karageorghis and Kouka 2011). Even though there is no hard and fast link between particular types of vessels with the processing or preparation of particular foods (*i.e*. a wok can be used as a frying pan for French fries instead of a stir fry or vice versa), it is a common assumption that changes in cooking equipment may indicate changes in culinary practices (Lis 2015; Rotroff, 2015; Whitley and Boileau 2015).

The connection between cultural groups and specific culinary cultures has not been explored extensively in the Aegean context during the Middle Bronze Age (MBA; 20th–18th centuries BC) and earlier Late Bronze Age (LBA; 17th–15th centuries BC). During this period, island and coastal communities were connected to different regions through exchange and interaction networks, and they experienced cultural change that seems to have been correlated with their degree of participation in those networks. In the Cyclades and elsewhere, changes in material culture and practice were clearly influenced by Cretan palatial culture, a phenomenon called "Minoanization" (recently, Broodbank 2004; Davis and Gorogianni 2008;

Macdonald *et al*. 2009; Gorogianni *et al*. 2016). Changes in culinary technologies were part of this transformation and have been cited as an index of culture change and evidence of colonists or migrants from Crete (*e.g*. Schofield 1983a, 45–48, 1983b; Branigan 1984, 51; Hägg and Marinatos 1984, 221; Wiener 1990, 135; 2013, 155; Kaiser 2005). Nevertheless, comprehensive analyses of MBA–LBA cooking equipment and practice are not standard in the Cyclades (with some exceptions, *e.g*. Birtacha 2008; Müller *et al*. 2013; 2015).

This paper uses cooking pot shapes as an initial indication of diverse culinary practices during the Minoanization phenomenon, a period of intense interconnections and roaming "cultural influences" in the Aegean (although of course other such periods of intense interconnectivity existed in both earlier and later contexts in the region). It investigates the adoption and perpetuation of different types of cooking equipment at the site of Ayia Irini, Kea, as a means of exploring the evidence for and implications of changing cooking practices in this Cycladic community over time.

The site of Ayia Irini on Kea is an ideal candidate for such an investigation. It was re-founded in the earlier MBA after a long abandonment, after which it was continuously occupied until the mid-LBA (see Table 7.1); Ayia Irini was a major exchange hub in Aegean networks during most of this period. Based on the diverse ceramic, textile, and cooking technologies in local use from the earliest phases of this period, it has been argued that the MBA re-foundation of the site likely incorporated people from different regions, including central Greece, Aegina, the Cyclades, and Crete, who were probably drawn to the area because of its advantageous location on a major maritime corridor and proximity to metal resources on the opposite shore of Attica, *i.e*. Lavrion (Crego 2007; Gale and Stos-Gale 2008; Overbeck and Crego 2008; Gale *et al*. 2009; Abell 2014a). In subsequent periods, the material culture of Ayia Irini continued to preserve elements of material culture from each of those regions, while at the same time new forms of material culture were adopted, likely a result of both trade and an ongoing trickle of migration from various Aegean regions into Ayia Irini over the course of the MBA–LBA (Abell 2014b, 548–560; Gorogianni *et al*. 2015; Gorogianni 2016). In its role as an exchange hub at the intersection of regional networks and with a local population that seems to have been open to adopting and adapting non-local ways of doing things from surrounding culturally diverse areas, Ayia Irini acted as a kind of "middle ground" (White 1991), similar to neighboring communities and trade partners, but also different from them (Abell 2014b, 581–590).

Table 7.1. Chronological concordances in the Aegean. Bronze Age dates (after Manning 2010, 23, table 2.2). Final date for activity in the area of the Temple provided by a coin probably of Ptolemy Philadelphus (Caskey 1998, 127)

Aegean	*Relative chronology*	*Approximate absolute dates BC*	*Ayia Irini*
Final Neolithic	FN	3500–3000	Period I
Early Bronze Age	EB I	3000–2650	Hiatus
	EB II	2650–2200	Period II
			Period III
	EB III	2200–2000	
			Hiatus
Middle Bronze Age	MB I	2000–1900	
	MB II	1900–1800	Period IV
	MB III	1800–1700	Period V
Late Bronze Age	LB I	1700–1600	Period VI
	LB II	1600–1400	Period VII
	LB III/LH IIIA	1400–1300	Period VIII
	LB III/LH IIIB	1300–1200	
	LB III/LH IIIC	1200–1100	
Iron Age	Protogeometric	1100–900	Hiatus?
	Geometric	900–800	Activity around Temple and in Northern Sector
Archaic		800–480	
Classical		480–323	
Hellenistic	Early Hellenistic	323–268/7	Final phase of activity in Temple

The idiosyncrasies of the Keian assemblage in the subsequent Minoanization period (later MBA–mid-LBA, 18th through 15th centuries BC) have been rather underemphasized, since most effort has focused on recovering and analyzing Cretan aspects of material culture change, with less attention to non-Cretan ones. For example, Ayia Irini has been considered fully Minoanized in part because Cretan cooking and consumption equipment, particularly tripod jars and conical cups, are very common (Schofield 1983a; 1983b; Wiener 1990, 135; 2013, 155). While Cretan influence on eating and drinking at the settlement is undeniable, there is an inherent bias in assessing the influence of non-local culinary technologies that has been hitherto overlooked, and perhaps makes the Minoanization of the kitchen at Ayia Irini (and potentially other sites) a foregone conclusion. We, therefore, present below a more holistic discussion of culinary technologies and suggest that cooking practices at the site in this period were diverse.

The dataset used for this exercise is composed of material primarily from two assemblages that are currently under study by the authors, the Northern Sector and Area B, and secondarily from the published assemblages of House A (Cummer and Schofield 1984), the Western Sector (Schofield 2011), and Period V (Davis 1986), as well as individual vessels with potter's marks, published by Bikaki (1984) and Lindblom (2001). The objects presented in the catalog below represent all cooking vessels (both well-preserved and as smaller sherds). Tripod legs that are mentioned in the text of those publications but not given a catalog number are not included here. Cooking shapes are identified primarily through comparison to known cooking shapes from Crete, Mainland Greece, and Aegina; in many cases, the presence of traces of burning on these vessels also suggests their use as cooking vessels. Information about burning is included in the catalog entries. The terms "Minoanizing" and "Cretan-", "Mainland-", or "Aeginetan-style" refer to shapes and do not imply a particular region of production; vessels that are likely to have derived from those regions on the basis of their fabric (rather than being a local shape imitative of the kinds of shapes used in other regions) are

described as “Cretan”, “Aeginetan”, or “Mainland” imports. Non-local fabrics at Ayia Irini are, for the most part, easily distinguished from the local red-brown, schist-rich fabrics. While broad ware categories of imports from the mainland, Cyclades, and Crete have been verified through petrographic analysis (Davis and Williams 1981), an ongoing program of fabric analysis in the Northern Sector by Hilditch and in Area B by Abell (2014b) has clarified the characteristics of an even wider variety of imported fabrics, including those from Aegina; Aeginetan fabric groups in particular have been developed in comparison with the publication of detailed fabric analyses at Kolonna (Gauss and Kiriatzi 2011).

Minoanization as a foregone conclusion

Tripod cooking was a quintessentially Minoan technology, present on Crete as early as EM I (Warren *et al.* 1974; Shank 2005; Davaras and Betancourt 2012). This technology, which allowed for placement of the cooking vessel directly over the hearth, rather than submerged in the embers (Lis 2015), was widely adopted outside Crete during the MBA–LBA (Georgiou 1983; Dickinson 1994, 116–117). Deposits at Ayia Irini are replete with evidence of their use, since the legs are extremely resilient to breakage. Moreover, in the process of “papsing” (discarding common or uninformative material, especially featureless local coarse wares and commonly occurring parts of vessels), tripod legs were often discarded but meticulously counted (Gorogianni 2008, 97–107). Therefore, evidence for tripod technologies (even when absent after papsing) is abundant in the archaeological record of later MBA–LBA Ayia Irini.

At Ayia Irini, the co-existence of Mainland or Aeginetan-style cooking traditions with Cretan ones, as represented by the kind of vessels in use, has been underemphasized. Nevertheless, the presence of imported Aeginetan cooking pots is well documented (Bikaki 1984; Lindblom 2001). There are several reasons for this omission. On one hand, the features of Mainland-style cooking pots are less distinctive than tripods, especially when discovered in fragmentary state; they are, therefore, more likely to have been papsed. Moderately fine to coarse local Keian fabrics were used for table, storage, and cooking wares, in both Minoanizing and non-Minoanizing shapes, in all periods. Although several subgroups of the local red-brown fabric exist, these do not correlate in predictable ways to chronological, functional, or stylistic differences, and are distinguished from one another on the basis of relatively minor variations in the quantity and color of schist and mica inclusions (Abell 2014b; Hilditch n.d.). This relative homogeneity prohibits recognition of cooking vessels on the basis of fabric. Furthermore, the terminology used for Mainland-style cooking shapes is not distinctive, as in the case of nos 69, 70, and 73 in the catalog below. In their respective publications, these vessels are characterized as one-handled or two-handled jars, descriptions that are technically correct but do not convey clearly the cultural affiliation or function of the shape. Consequently, the assemblage has been predisposed toward being characterized as fully Minoanized. Thus, in this paper, the authors survey as thoroughly as possible the shapes connected to cooking in order to present a more nuanced picture of the culinary technologies at the site.

Prelude to Minoanization: Cooking in Period IV

Before the beginning of the Minoanization phenomenon, in Period IV (see Table 7.1), the primary cooking vessel was the wide-mouthed jar (Fig. 7.1). A globular profile, everted rim, and one or more vertical handles attached at the shoulder or rim are features common also to cooking jars found on the mainland and Aegina (Maran 1992b, no. 220a; Zerner 1993, 44; Lindblom 2001, 27–28, nos S-14, S-15, and S-16, fig. 4). Most bases were probably pedestaled, (*e.g.* Overbeck 1989, no. CE-133), although some were flat (*e.g.* Overbeck 1989, 62). Pedestal bases were a feature of Cycladic cooking vessels in the Early Bronze Age (*e.g.* Wilson 1999, 32) and may represent a traditional Cycladic method of cooking food. Although many wide-mouthed

jars in Period IV preserve evidence of burning, others do not, and some well-preserved jars with the same basic shape were also used as burial containers (*e.g*. Overbeck 1989, nos 2-1, 8-15, and 15-1). Thus, the shape was not restricted entirely to cooking vessels but could be adapted to other uses.

Tripod jars and baking trays appeared in early Period IV deposits (Overbeck 1989, 110, 127, 129, 163, and 172). Both shapes are associated with cooking methods on Crete (Betancourt 1980; see also Martlew 1988; Barnard and Brogan 2003, 80–87; Rutter 2004; Poursat and Knappett 2005, 56–57; Shank 2005; Rutter and Van de Moortel 2006; Tsipopoulou and Alberti 2011). Although tripod jars and baking trays appeared in early Period IV, they did not become common until the final phase of Period IV (IVc). The limited use of these shapes – and presumably related cooking techniques – over the course of Period IV is comparable to the limited use of Minoanizing drinking and pouring vessels and attests a particular multiculturality that also seems typical of the Keian assemblage in subsequent periods (Abell 2014b, 581–606).

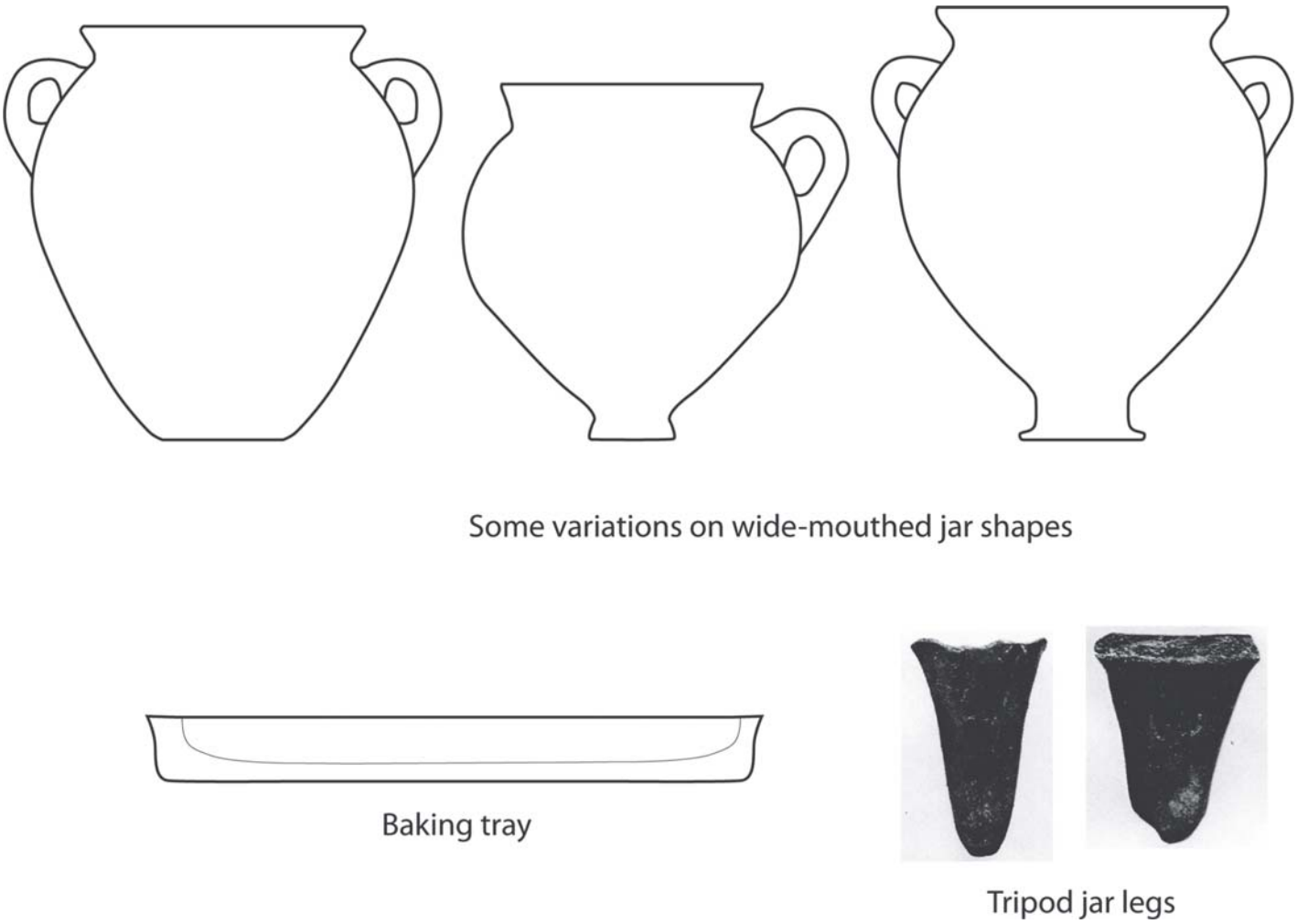


Figure 7.1. Cooking shapes of Period IV. After Caskey 1972, fig. 10, pls 85, 87, nos D85, D88, D89, E14, E16; Overbeck 1989, pls 37, 38, nos. C-13, E-11. Courtesy of the Kea Excavations Archive, University of Cincinnati and J. C. Overbeck. Not to scale

Aegean fusion: a perspective from cooking pots

Period V (see Table 7.1) witnessed a major shift toward local participation in Minoanizing eating, drinking, and cooking practice, as well as in other aspects of local material culture; the Minoanization of the assemblage, however, was never complete – that is, non-Minoanizing forms of material culture persisted, as

demonstrated by the following discussion of the cooking vessels.

Minoanizing shapes

Four major Minoanizing shapes, tripod jugs, jars, and trays, as well as flat bottomed trays, exist among cooking vessels during Periods V–VII (see Table 7.1), but they did not appear simultaneously (Betancourt 1980; see also Martlew 1988; Barnard and Brogan 2003, 80–87; Rutter 2004; Poursat and Knappett 2005, 56–57; Rutter and Van de Moortel 2006; Tsipopoulou and Alberti 2011). Tripod jars and flat-bottomed baking trays are first documented in Period IV. The earliest tripod trays from unmixed deposits date to Period V. Tripod jugs are not attested until Period VI.

Nearly all Minoanizing vessels were produced in the common local red-brown, schist-rich fabric (Davis and Williams 1981; Abell 2014b, 626–636; Hilditch n.d.). Only a few imported cooking pots have been documented in each period. These include tripod jars likely from the central Cyclades (no. 10) and Aegina (no. 23); trays probably from the Cyclades (nos 31, 66) and Crete (no. 56); and a tripod tray probably from Aegina (no. 30). Since cooking pots do not seem to have been a major item of exchange for Cretan or Cycladic potters (as opposed to, perhaps, Aeginetan ones), it is possible that the presence of rare imported cooking vessels in Period V deposits might be evidence for the mobility of at least a few cooks in this period; a similar line of thinking has been explored with respect to the evidence for non-local loomweights at MBA–LBA Ayia Irini and elsewhere in the Cyclades (Cutler 2012; Gorogianni *et al*. 2015).

Tripod jars and jugs

Tripod jars and jugs were very common during Period VI and continued to be used during Period VII and later; no complete profile has been recovered from Period IV or V deposits. This absence might be an accident of preservation (although many fragments of tripod baking trays have survived from Period V deposits in the Northern Sector). In addition to physical tripod jars, the miniature fresco of the Northeast Bastion, which accommodated a formal dining room and was constructed in early Period VI (Gorogianni and Fitzsimons in press), depicts a scene in which men cook with tripods in what seems to be anticipation of a feast (Morgan 1998; in press).

Tripod jars of Periods VI and VII conform to Betancourt's Type B (Figs. 7.2, 7.3; Betancourt 1980, 2–3; see also Barnard and Brogan 2003; 2011; Rutter 2004; Rutter and Van de Moortel 2006; Tsipopoulou and Alberti 2011). They have cylindrical or slightly rounded open bodies with slightly incurving lip, flat bottom, and occasionally pinched-out spouts. They usually bear two horizontal handles or lugs, although there are at least two Period VII morphological variants which preserve round vertical handles; however, one of these (no. 17) is the single example of a burnished tripod and the other (no. 23) is imported, so a local preference for horizontal handles on plain tripod jars remains clear.

Although our dataset comprises a small sample, some observations can be made. Three general sizes of tripod exist: large, with a rim diameter of 0.32–0.27m.; medium, 0.24–0.14m.; and small, 0.10–0.09m, which seems to be reserved for tripod jugs (below). All tripods with a rim diameter smaller than 0.15m. date to Period V or early Period VI, although it is unclear whether this is an accident of preservation or selective publication. The ratio between tripod height and rim diameter ranges from 1.1–1.3. Little can be said about the chronological development of the shape, but nearly all examples with a deeper bowl and shorter legs (nos 15, 22, 26) date to Period VII, as does the only example with a shallow bowl (no. 25). With respect to imports, while the Cycladic tripod (no. 10) conforms to the usual shape at Ayia Irini, the Aeginetan example (no. 23), with its everted rim and vertical handles, shares more in common with Mainland-style cooking jars than most tripods at Ayia Irini (Lindblom 2001, fig. 4, no. S-15; see also nos. 68, 70, 72, 73, and 79).

Tripod jugs are smaller than jars, with shallow rounded bowls, pinched-out spouts and a round-section handle opposite the spout. The example from the Northern Sector (no. 29) has nipples set approximately on the maximum diameter of the bowl on either side of the spout, but slightly offset.

Baking trays

Circular baking trays were particularly common in Period V deposits in comparison with tripod jars, but examples have been found throughout Periods V–VII; one likely tray leg from Area B came from a Period IV deposit that had been disturbed in Period VII, but no tripod trays from closed Period IV deposits have been published. The shape of the profile varies widely and defies categorization, at least in the present sample, although legs, when found, are usually large and flattened in section (Figs. 7.4, 7.5). One distinction probably is functionally meaningful: the finishing of the underside (Davis 1986, 87). The underside of some trays has been left unsmoothed, but not that of others. Probably the first category was legless and sat on the ground or hearth, while the second was of the tripod variety. Therefore, in our catalog, trays with a smooth underside are designated as tripods. Only four of the 37 trays are non-local. No. 30 (Period IV+VII) probably came from Aegina, the two that date to Period V (nos 31, 56) probably came from Melos or Thera and Crete respectively, and no. 66 (Period VII) is probably from somewhere in the Cyclades.

Non-Minoanizing cooking shapes: mainland-style cooking jars

Although Minoanizing shapes, especially tripods, dominated Period V–VII cooking assemblages, Mainland- and Aeginetan-style cooking vessels were also a feature of Period VI and VII deposits. No Mainland- or Aeginetan-style cooking jars dating to Period V have yet been identified. Nevertheless, such vessels exist in Period IV, VI, and VII deposits, and it is possible that the fragmentary character of Period V deposits, as well as the limited distinctiveness of Mainland-style cooking pot features in comparison with tripods, may have obscured the presence of such shapes in Period V.

In comparison with Minoanizing shapes, which were almost entirely local products, most Mainland-style cooking jars were imported from Aegina; only four of 17 cataloged examples were manufactured locally (nos 69–71, 73). This discrepancy may result from the fact that the distinctiveness of Aeginetan fabrics as non-local products, in combination with the presence of potter's marks, likely aided preservation of these jars during pottery processing and papsing. Local jars, however, were probably more routinely papsed unless the complete profile was recovered, since coarse, plain, and local sherds were particularly discriminated against during this process. We have not examined most of these jar bases ourselves, but Lindblom (2001) reports that all of them are manufactured in the typical cooking fabric found at Kolonna, and many have preserved traces of burning. Thus, all are included here as probable cooking pots.

In comparison with Period IV wide-mouthed jars, the shape of these later jars among local products is slightly different (Fig. 7.6). No. 69 has a less sharply everted rim than Period IV jars, while a variety of base types are attested – flat, slightly raised, or conical – but not pedestaled. Some Aeginetan imports also had higher conical or cylindrical bases than exist among the few local jars. While Period IV jars might have one or two vertical round-section handles attached at rim or shoulder, all later examples were attached at the shoulder, and no cataloged jars have two preserved handles, although one (no. 73) has been restored as a two-handled jar. The lack of two-handled versions in our sample may be an accident of preservation, given how few upper bodies (compared with bases) exist in this dataset.

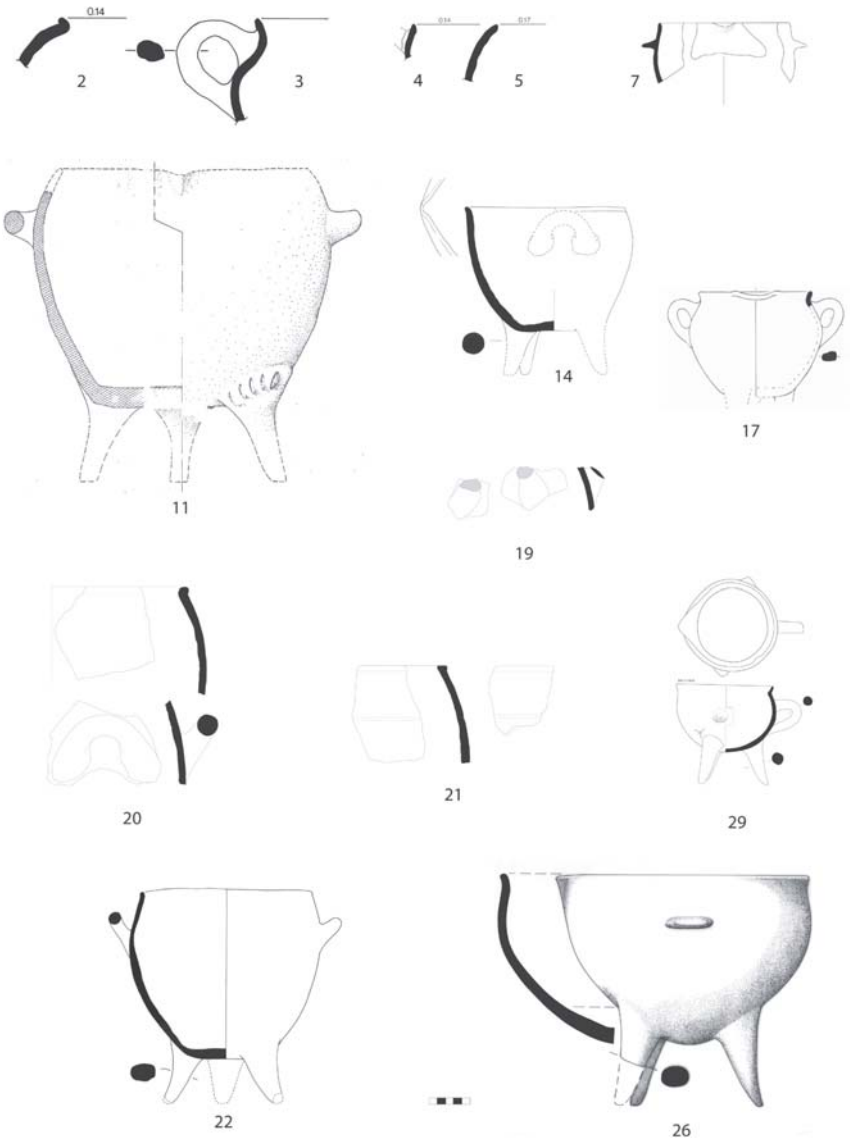


Figure 7.2. Tripod jars and jugs. Nos 2, 3, 4, 5, after Davis 1986, pls 23–24, courtesy of the author; no. 7 after Abell 2014b, fig. 85, drawing by A. H. Bikaki; no. 11 after Abell 2014b, fig. 92, drawing by J. M. Bouda; nos 14, 22, 26 courtesy of the Kea Excavations Archive, University of Cincinnati; no. 17 after Schofield 2011, pl. 68; courtesy of the Kea Excavations Archive, University of Cincinnati; nos 19, 20, 21, 29, drawings by T. Ross

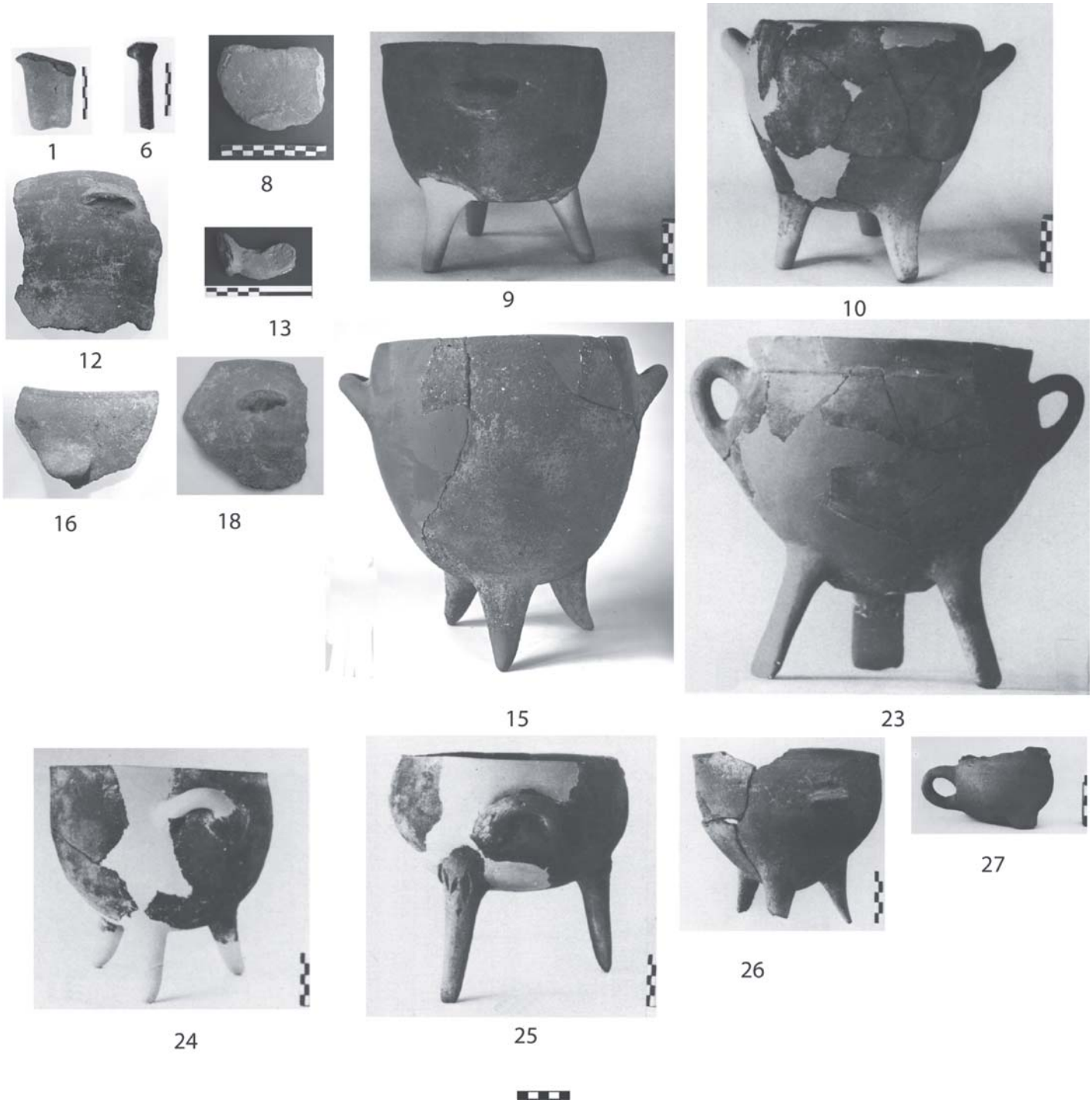


Figure 7.3. Tripod jars and jugs. Nos 1, 6 after Davis 1986, pls 48, 65, courtesy of the author; nos 8, 13 after Abell 2014b, figs 85, 168; no. 9, 10, 23–27 after Cummer and Schofield 1984, pls 53, 61, 65, courtesy of the Kea Excavations Archive, University of Cincinnati; nos 12, 15, 16 after Schofield 2011, pls 40, 46, 47, courtesy of the Kea Excavations Archive, University of Cincinnati

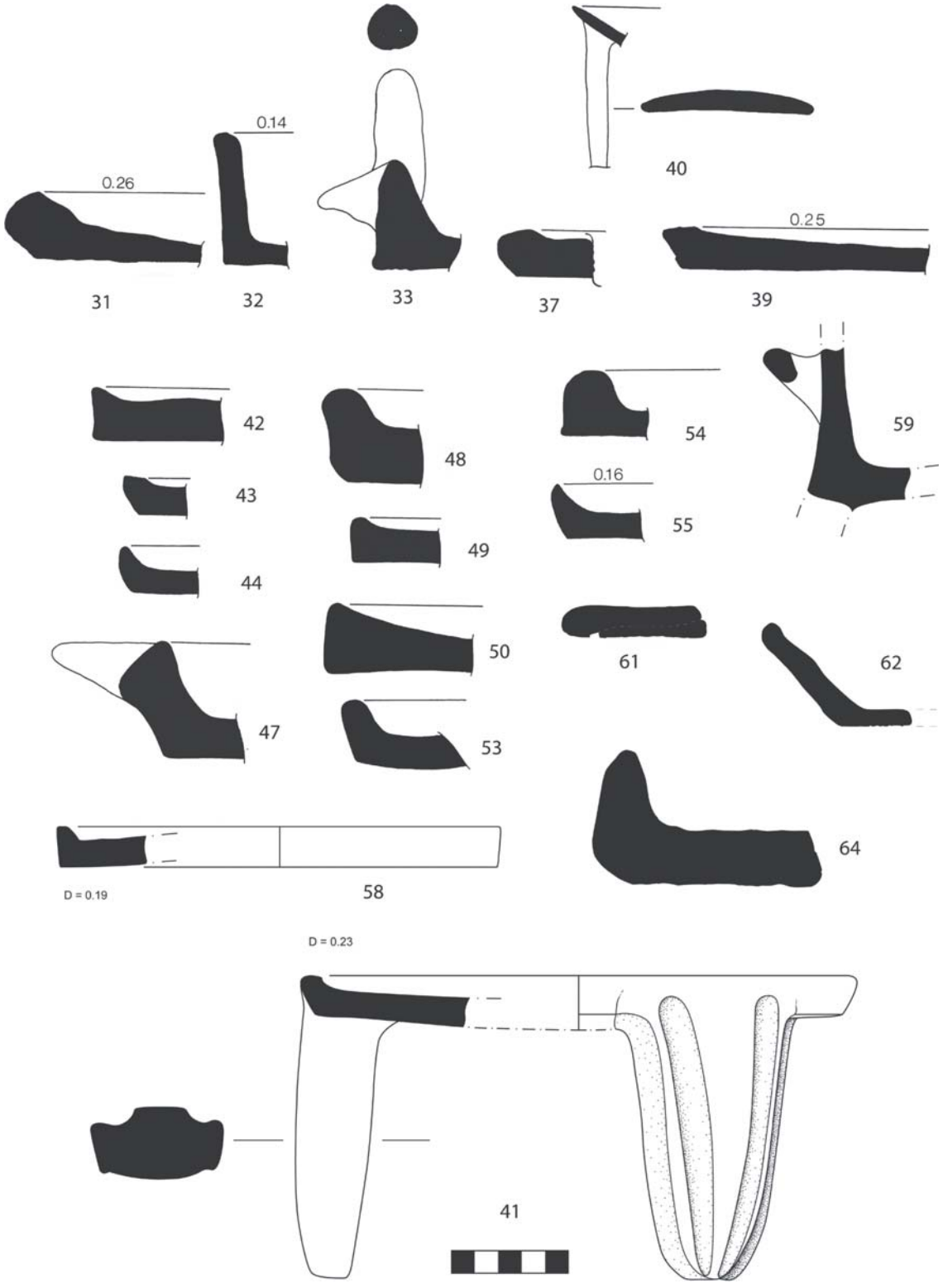


Figure 7.4. Baking trays. Nos 31–33, 37, 39–44, 47–50, 53–55 after Davis 1986, pls 24, 25, 27, 30, 35, 50, 53, 54, 59, 64, courtesy of the author; nos 58, 59, 64, drawings by C. Kolb; nos 61, 62, drawings by T. Ross

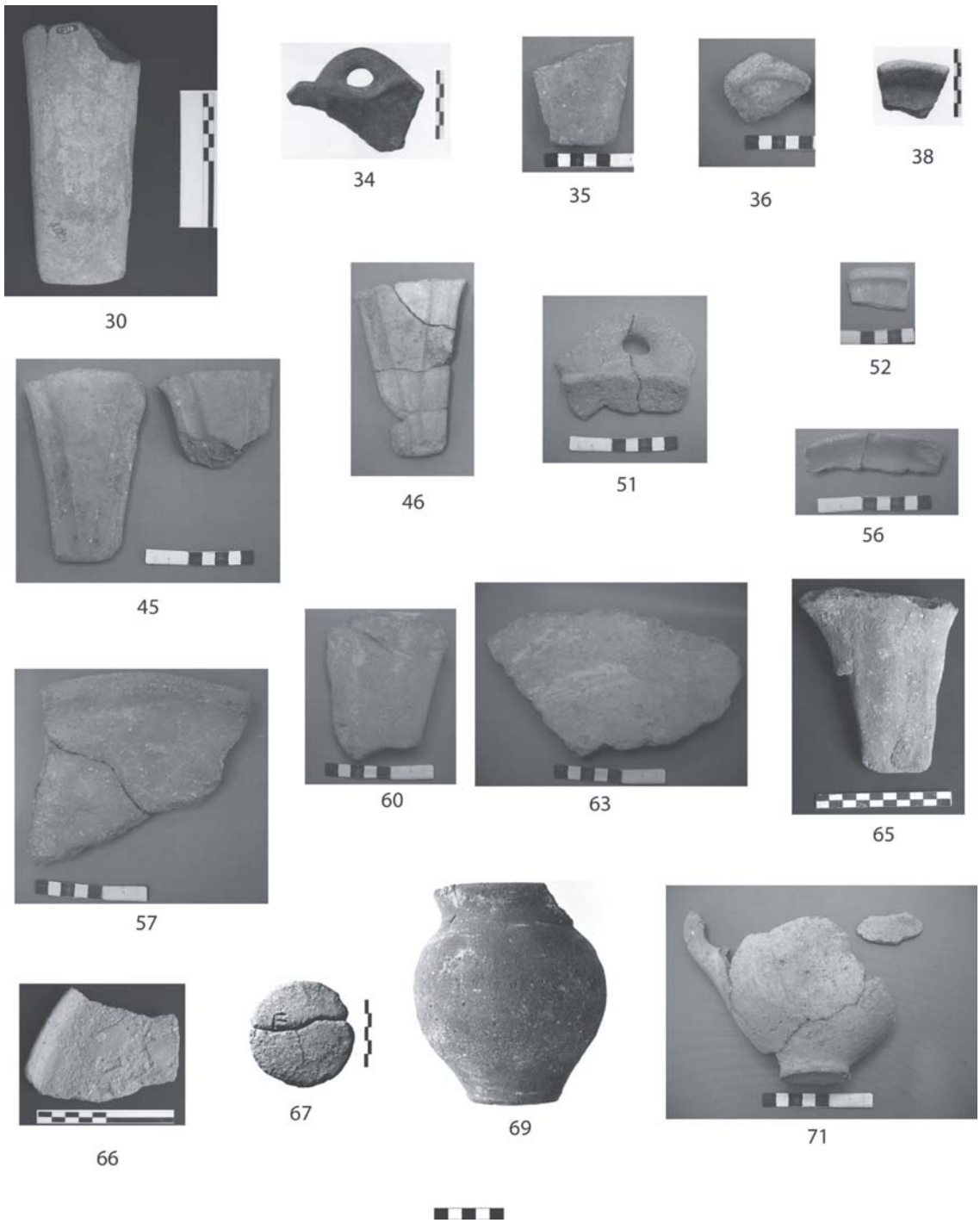


Figure 7.5. Baking trays and Mainland- or Aeginetan-style cooking jars. Nos 30, 65, 66 after Abell 2014b, figs. 142, 147; nos 34–36, 38, 51, 52 after Davis 1986, pls 54, 59, courtesy of the author; nos 45, 46, 56, 57, 60, 63, 71 after Gorogianni 2008, fig. 55; no. 67 after Lindblom 2001, pl. 11, 23, courtesy of the author; no. 69 after Schofield 2011, pl. 39, courtesy of the Kea Excavations Archive, University of Cincinnati

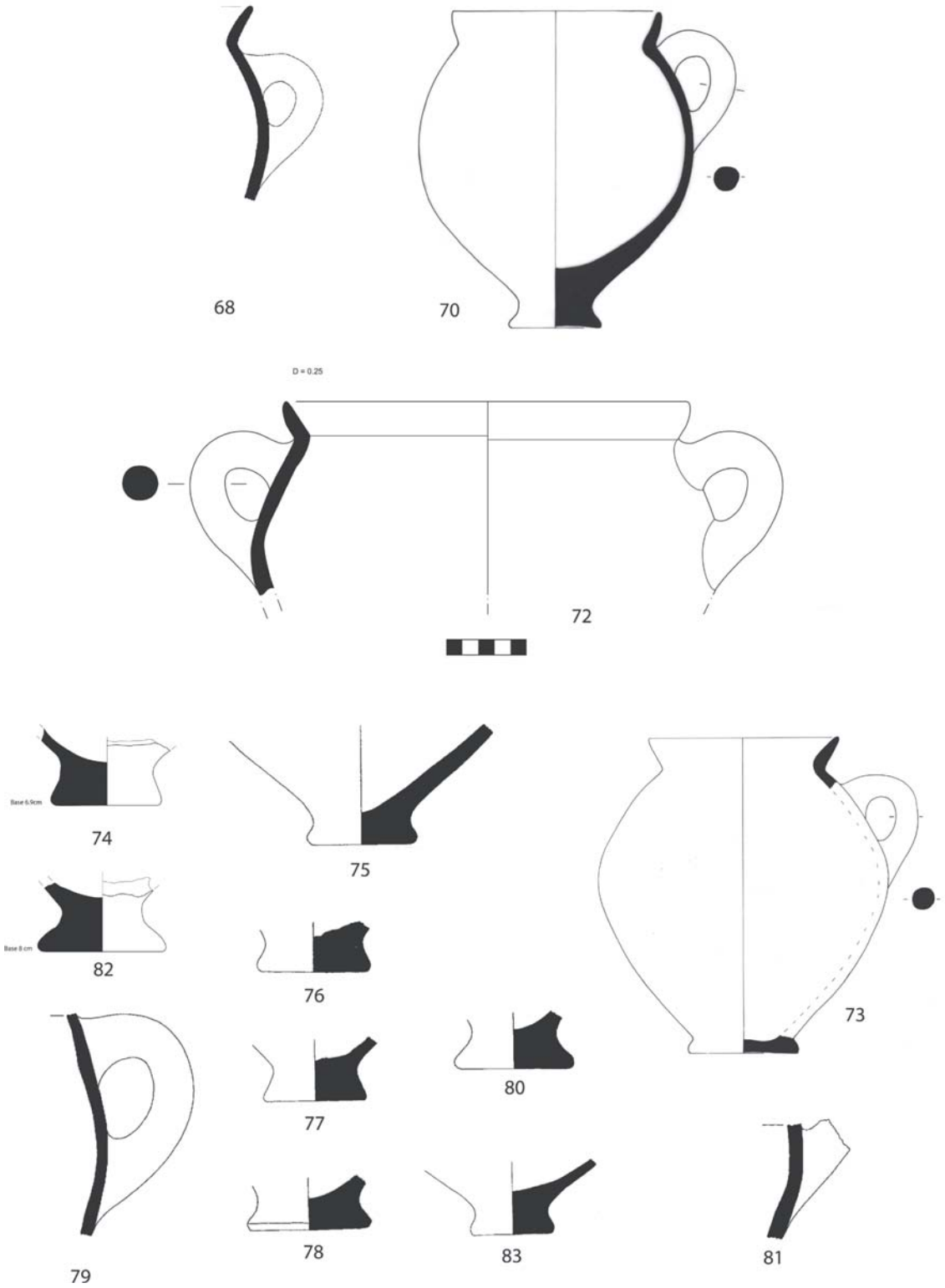


Figure 7.6. Mainland- or Aeginetan-style cooking jars. Nos. 68, 75–81, 83, after Lindblom 2001, pls 7, 9, 16, 21, 50, 52, 53, courtesy of the author; nos 70, 73, courtesy of the Kea Excavations Archive, University of Cincinnati; no. 72, drawing by C. Kolb; no. 74, drawing by T. Ross

Conclusions

Ayia Irini on Kea has routinely featured in discussions of acculturation, migration, and entanglement in the MBA–LBA Aegean, especially in connection to the Minoanization phenomenon. Changes in local material

culture have been attributed to an array of processes, including trade, direct political control by Cretan palatial polities, or emulation driven by local socio-political considerations. Such arguments typically (but not always, *e.g*. Schofield 1983a) focus primarily on Minoanizing features rather than considering both Minoanizing and non-Minoanizing forms of material culture together. Thus, this paper surveyed both Minoanizing and non-Minoanizing cooking shapes from Ayia Irini, in order to provide a more holistic perspective on culinary practices at the settlement.

Cooking shapes (and presumably cooking practices in which those shapes would have been used) at Ayia Irini were undeniably Minoanized, with tripod jars and baking trays being common throughout Minoanization phenomenon (Periods V–VII), although they also appeared in a limited fashion in the previous period. However, non-Minoanizing cooking shapes, and perhaps similarly non-Minoanizing culinary practices, are attested over the course of this period as well. This fact has been underemphasized not only because non-Minoanizing aspects of the assemblage have received less attention generally, but also because archaeological practices used at the time of the excavation likely led to the underrepresentation of non-tripod jar shapes in the preserved dataset. In addition, the lack of standardized naming of non-tripod cooking jars in site publications (*e.g*. jar, one-handled jar) has masked the presence of distinctively non-Minoanizing cooking traditions in the MBA–LBA.

As mentioned in the introduction to this paper, the presence of cooking equipment from different cultural regions has often been interpreted as evidence of different cooking traditions that are in turn correlated with groups with different cultural affiliations. Even if that is not strictly the case, differences in shape between Minoan or Minoanizing and Mainland/Aeginetan-style cooking pots suggest significant differences in the postures, gestures, and movements of cooks using them. Thus, the use of a tripod jar instead of a jar with a flat, raised, or conical base suggests different methods of interaction between the vessel and heat (Hally 1983; Skibo 1992; Lis 2015, 106–108), whereas different handle arrangements and the lack of spouts on Mainland/Aeginetan-style jars compared to Minoan-style ones suggest that the two categories of jars were handled differently and their contents were extracted in different ways. These implied differences support the possibility that these shapes were used to prepare different kinds of food (Rice 2015, 411–415, 422–424; Lis 2015, 104–106).

If the presence of cooking equipment from different traditions indeed correlates with different cooking habits, then food preparation, like consumption practices, was remarkably multicultural at Ayia Irini over the course of the MBA–LBA, before and during the Minoanization phenomenon. The persistence of non-Minoanizing shapes, often found in the same contexts as their Minoanizing counterparts, implies that non-Minoanizing cooking shapes continued to be used by some residents of the site, perhaps (but not necessarily) to prepare foods using non-Minoanizing recipes and techniques. Diversity in the cooking assemblage is perhaps to be expected given the multicultural nature of tablewares, which incorporated shapes of different Aegean regions to a greater extent than did those from other contemporary Cycladic settlements (Abell 2014b, 581–583, 597–599, 604–606; Gorogianni 2016); the assemblage is so diverse that the settlement has been called “culturally promiscuous” (Broodbank 2004, 62). Exchange and elite interaction no doubt affected culture change at the settlement in the MBA–LBA. Nevertheless, it also seems likely that the possible mobility of cooks, as well as the interplay of different regional culinary traditions more generally, would have influenced ideas of local and regional cultural identity within the community, as the sights, smells, and flavors of the town marinated over time. The mingling of different culinary traditions or the development of fusion cuisines in situations of cultural contact and mobility is, of course, a more recent phenomenon as well and may be driven by a variety of causes, as for example in the case of a resettlement of Chinese immigrants along the Mexico–US border following the 1882 Chinese Exclusion Act (Romero 2010). This resettlement contributed to the blending of ingredients, dishes, preparation equipment, and techniques, and it produced a unique fusion that has become characteristic of that particular region (Morehouse 2015). In

the case of Ayia Irini, the Aegean fusion that seems to have typified its cuisine over the long term was likely shaped by the status of the community as a middle ground that incorporated aspects of neighboring cultural traditions (culinary and otherwise) into an idiosyncratic way of life that was paralleled in some ways on Crete, Aegina, Mainland Greece, and the other Cycladic islands, but which was, as a whole, distinctively Keian.

Catalog

Abbreviations

P.V.: Davis 1986
H.A.: Cummer and Schofield 1984
W.S.: Schofield 2011
A.B.: Abell 2014b
P.M.: Bikaki 1984
N.S.: Gorogianni 2008
N.B.: Gorogianni and Fitzsimons in preparation
C.O.P.: Caskey 1972
LIN: Lindblom 2001
N.ST.: Not studied by the authors
MM, LM: Middle Minoan, Late Minoan
MH, LH: Middle Helladic, Late Helladic
MC, LC: Middle Cycladic, Late Cycladic

Minoanizing Shapes: Tripod Jars and Jugs[2]

1. Tripod jar (?) (P.V. E-18, pl. 48) (Fig. 7.3). Leg;[3] tip very worn. N.ST. Room EJ.13 and EJ.14. Period V.
2. Tripod jar (?) (P.V. G-2, pl. 23) (Fig. 7.2). D. rim est. 0.14. N.ST. Room W.13. Period V.
3. Tripod jar (P.V. G-3, pl. 23) (Fig. 7.2). Flaring rim,[4] vertical handle. N.ST. Slipped yellow inside. Room W.13. Period V.
4. Bowl/tripod jar (P.V. L-1, pl. 24) (Fig. 7.2). Rim with scars for handle. D. rim est. 0.14. N.ST. Evidence of burning. Room W.30. Period V.
5. Jar/tripod (?) (P.V. L-2, pl. 24) (Fig. 7.2). Rim. D. rim est. 0.17. N.ST. Evidence of burning. Room W.30. Period V.
6. Tripod jar (?) (P.V. AK-17, pl. 65) (Fig. 7.3). Leg. Bottom broken. N.ST. Room G.6. Period V.
7. Tripod jar (?) (A.B. 44, fig. 85) (Fig. 7.2). Upper third preserved. Lugs on either side of spout. H. pres. 0.08, D. rim est. 0.14. Coil-built, wheel-finished. Evidence of burning. Room B.1. Early Period VI.
8. Tripod jar (A.B. 45, fig. 85) (Fig. 7.3). Base with scar for leg. Hand-built (?). Evidence of burning. Room B.1. Early Period VI.
9. Tripod jar (K.2167; H.A. 852, pl. 65) (Fig. 7.3). Legs missing. Rim and lug chipped; restored. Lugs on either side of the spout. H. rest. 0.22, D. rim 0.185/.22, D. base 0.15. Coil-built, wheel-finished. Traces of white substance on lower half of bowl. Room A.18. Period VI.
10. Tripod jar (K.2739; H.A. 853, pl. 65) (Fig. 7.3). More than half preserved; handle, one and one-half legs missing; restored. Flattened legs with slight central ribbing; scoring above one leg. H. 0.234, D. rim 0.21, D. base 0.144. Non-local (Central Cyclades). Coil-built. Evidence of burning on exterior and interior around spout. Room A.18. Period VI.

11. Tripod jar (K.1824; A.B. 101, fig. 92) (Fig. 7.2). 80% preserved. Leg and bottom half of other two ovoid-section legs missing; restored. H. est. 0.39, D. rim est. 0.31. Coil-built. Evidence of burning at bottom. Seven deeply incised, vertical lines at point of leg attachment. Room B.1. Period VI.
12. Jar (probably tripod) (W.S. 544, pl. 47) (Fig. 7.3). Rim with lug. Upper surface of lug concave. D. rim est. 0.24. N.ST. Room W.44. Period VI.
13. Small tripod jar (A.B. 735, fig. 168) (Fig. 7.3). Base and scar for leg. D. base est. 0.07. Hand-built. Evidence of burning on the interior. Alley AB. Period VI, plus IV/V.
14. Tripod jar (K.2681; H.A. 594, pl. 58) (Fig. 7.2). Handles, one and one-half leg missing; partially restored. Slightly rounded bottom. H. 0.224, D. rim 0.194, D. bottom 0.105, max. D. 0.165. Coil-built. Discolored in places; badly eroded. Room A.17. Period VI/VII.
15. Tripod jar (K.3455; W.S. 44, pl. 40) (Fig. 7.3). 65% preserved. Handle and tip of leg missing; restored. H. 0.303, D. rim rest. 0.239. N.ST. Surface badly eroded in places; scorching at bottom and around one leg. Room F.1. Periods VI/VII, VIII.
16. Tripod jar (?) (W.S. 398, pl. 46) (Fig. 7.3). Rim with lug. D. rim est. 0.22. N.ST. Room W.36. Probably Period VIIa.
17. Tripod jar (K.1558; W.S. 1558, pl. 68) (Fig. 7.2). 70% preserved. Legs missing; partially restored. Short everted rim, flattened vertical handles, small knob at rim opposite spout. H. pres. 0.136, D. 0.177/.165, D. rim 0.136. N.ST. Burnished. Surface heavily blackened inside and out, especially at front between the handles. Room EJ.8. Period VIIa.
18. Jar (probably tripod) (N.S. N22-05) (Fig. 7.3). Rim with triangular-section lug. H. pres. 0.086, D. rim est. 0.16; max. dim. pres. 0.088. Coil-built. Room N.10. Period VIIa.
19. Jar (tripod?) (N.B. N.20-06) (Fig. 7.2). Shoulder with scars for handle attachment. Coil-built. Room N.20. Period VIIa.
20. Bowl (tripod?) (N.B. N.20-20) (Fig. 7.2). Short everted rim, handles. Joining and non-joining fragments. D. rim est. 0.32. Coil-built. Interior possibly slipped. Room N.20. Period VIIa.
21. Large jar (tripod?) (N.B. N.20-26) (Fig. 7.2). Flattened rim. H. max. 0.124, D. rim 0.20, max. dim. pres. 0.125. Coil-built. Room N.20. Period VIIa.
22. Tripod jar (K.2685; H.A. 693, pl. 61) (Fig. 7.2). More than half preserved. Leg and handle missing; restored. Flattened short legs. H. 0.258, D. rim est. 0.204, max. D. 0.23. Coil-built. Exterior, evidence of burning on side. Room A.17. Period VII.
23. Tripod jar (K.2892; H.A. 694, pl. 61) (Fig. 7.3). Half preserved. Handle, one and one-half legs missing; restored. Broad, sharply everted rim, vertical round handles, slightly convex bottom, flat legs. Below rim, shallow ledge molding with widely spaced oblique grooves. H. 0.325, D. rim 0.275, max. D. 0.30. Non-local (Aegina). Coil-built, wheel-finished. Evidence of burning. Room A.17. Period VII.
24. Tripod jar (K.1060; H.A. 692, pl. 61) (Fig. 7.3). Two thirds preserved. One handle and most of the legs missing; restored. Rounded bottom and ovoid-section legs. H. rest. 0.22, D. rim 0.18, max. D. 0.225. N.ST. Evidence of burning on the exterior, particularly bottom and spout. Room A.17. Period VII.
25. Tripod jar (K.1917; H.A. 363, pl. 53) (Fig. 7.3). 75% preserved; restored. Shallow bowl, thin walls. In addition to horizontal handles, two plastic knobs on side opposite spout; deep scoring at top of legs. H. bowl 0.138, H. with legs 0.228, D. rim 0.212, max. D. 0.24. N.ST. Room A.15. Period VII, disturbed in VIII.
26. Tripod jar (H.A. 364, pl. 53) (Fig. 7.3). Profile preserved. Small rounded lug; pointed bottom. H. bowl 0.165, D. rim est. 0.18. N.ST. Room A.15. Period VII, disturbed in VIII.
27. Tripod jug (H.A. 850, pl. 65) (Fig. 7.3). Legs missing; rim chipped. Ovoid-section leg(s). H. pres. ca. 0.76, D. rim 0.09. N.ST. Evidence of burning around spout. Room A.18. Period VI.
28. Tripod jug (W.S. 1748, not illustrated). Almost complete profile preserved. H. pres. est. 0.12. N.ST.

Room C.3. Mixed Period VI and VIII.

29. Tripod jug (K.4175; P.M. VII-9, pl. 25) (Fig. 7.2). 60% preserved; restored. Nipples on either side of handle and spout. H. 0.119, D. rim 0.104, max. D. 0.115. Hand-built. Three lines forming "Y" incised above leg. Rooms N.11 and N.12. Period VIIa.
30. Tripod tray (A.B. 567, fig. 147) (Fig. 7.5). Leg. L. pres. 0.178. Non-local (Aegina). Room B.4. Period IV, plus some VII.

Minoanizing shapes: baking trays

1. Tray (P.V. K-1, pl. 24) (Fig. 7.4). D. rim est. 0.26. Non-local (Melos or Thera.)[5] Wheel-made. NST. Room W.30. Period V.
2. Tray[6] (P.V. S-8, pls. 25, 50) (Fig. 7.4). Complete profile. H. 0.055, D. rim est. 0.14, D. base est. 0.12. Wheel-made. NST. Room J.3. Period V
3. Tray (P.V. AJ-8, pl. 35, 64) (Fig. 7.4). Complete profile. H. 0.055, D. rim est. 0.14, D. base est. 0.12. Wheel-made. NST. Room J.3. Same deposit contains several other tray fragments (Davis 1986, 69). Period V.
4. Tray (P.V. U-55, pl. 54; N.S. N07-059) (Fig. 7.5). Pinched-in rim with round horizontal handle below it. Max. H. 0.35; max. dim. pres. 0.98. Hand-built. Rooms N.1, N.2, and N.3. Period V.
5. Tripod tray (P.V. Z-12, pl. 59) (Fig. 7.5). Foot, slightly curved (probably from round tray). Incision near (0.09) edges of foot creates a ledge. Max. H. 0.075, max. dim. pres. 0.07. Hand-built. Room N.15. Period V.
6. Tray (P.V. Z-11, pl. 59) (Fig. 7.5). Body, with handle or lug (?). Max. H. 0.025, max. dim. pres. 0.06. Coil-built. Room N.15. Period V.
7. Tray (P.V. Z-13, pl. 59) (Fig. 7.4). Body. Max. H. 0.02, D. rim 0.30, D. base 0.29, max. dim. pres. 0.042. Coil-built, wheel-finished. Room N.15. Period V.
8. Tray (P.V. Z-14, pl. 59) (Fig. 7.5). Body. Max. H. 0.021, D. rim 0.16, D. base 0.18, max. dim. pres. 0.057. Wheel-made. Room N.15. Period V.
9. Tripod tray (P.V. U-45, pls. 27, 53) (Fig. 7.4). Rim. Max. H. 0.012, D. rim 0.25, max. dim. pres. 0.135. Coil-built, wheel-finished. Rooms N.1, N.2, and N.3. Period V.
10. Tripod tray (C.O.P. F58, fig. 12; P.V. U-46, pls 27, 53) (Fig. 7.4). Leg with part of tray; nearly complete profile. Max. H. 0.133, max. dim. pres. 0.168. Hand-built. Evidence of burning near rim. Rooms N.1, N.2, and N.3. Period V.
11. Tripod tray (C.O.P. F57, fig. 12; P.V. U-47, pls 27, 54) (Fig. 7.4). Two legs with part of tray. H. 0.124, D. rim 0.23. Coil-built, wheel-finished. Rooms N.1, N.2, and N.3. Period V.
12. Tripod tray (P.V. U-48, pls 27, 54) (Fig. 7.4). Rim. H. 0.18, D. rim 0.24. Coil-built. Rooms N.1, N.2, and N.3. Period V.
13. Tripod tray (P.V. U-49, pls 27, 54) (Fig. 7.4). Rim. Max. H. 0.21, max. dim. pres. 0.45. Manufacture method indeterminable. Rooms N.1, N.2, and N.3. Period V.
14. Tripod tray (P.V. U-50, pls 27, 54) (Fig. 7.4). Rim. Max. H. 0.021, max. dim. pres. 0.045. Wheel-made. Rooms N.1, N.2, and N.3. Period V.
15. Tripod tray (P.V., 42, uncatalogued; N07-052) (Fig. 7.5). Two legs. Max. H. 0.138, max. dim. pres. 0.092. Hand-built. Rooms N.1, N.2, and N.3. Period V.
16. Tripod tray (P.V., 42, uncatalogued) (Fig. 7.5) Three legs (one illustrated). Max. H. 0.131, max. dim. pres. 0.09. Hand-built. Rooms N.1, N.2, and N.3. Period V.
17. Tray (C.O.P. F56, fig. 12; P.V. U-51, pls 27, 54) (Fig. 7.4). Rim with lug. Max. H. 0.047, D. rim est. 0.58, D. base 0.54, max. dim. pres. 0.22. Coil-built. Rooms N.1, N.2, and N.3. Period V.

18. Tray (P.V. U-52, pls 27, 54) (Fig. 7.4). Rim. H. 0.39, max. dim. pres. 0.112. Coil-built. Rooms N.1, N.2, and N.3. Period V.
19. Tray (P.V. U-53, pls 27, 54) (Fig. 7.4). Rim with straight edge. Max. H. 0.02, max. dim. pres. 0.058. Manufacture method indeterminable. Rooms N.1, N.2, and N.3. Period V.
20. Tray (tripod?) (C.O.P. F54, fig. 12; P.V. U-54, pls 27, 54) (Fig. 7.4). Rim. Roughly smoothed underside; top surface scraped off. H. 0.029, D. rim 0.36, max. dim. pres. 0.11. Manufacture method indeterminable. Rooms N.1, N.2, and N.3. Period V.
21. Tray (P.V. U-56, pl. 54) (Fig. 7.5). Rim, round horizontal handle attached at rim. Max. H. 0.038, max. dim. pres. 0.111. Coil-built. Rooms N.1, N.2, and N.3. Period V.
22. Tray (P.V. U-57, pl. 54) (Fig. 7.5). Rim. Max. H. 0.021, max. dim. pres.0.048. Manufacture method indeterminable. Interior, slipped. Rooms N.1, N.2, and N.3. Period V.
23. Tray (P.V. X-3, pl. 30) (Fig. 7.4). 5% preserved. Rim and slightly rounded base. H. 0.028, D. rim 0.22, max. dim. pres. 0.043. Manufacture method indeterminable. Rooms N.7, N.8, and N.9. Period V.
24. Tray (P.V. X-4, pl. 30) (Fig. 7.4). Rim. H. 0.025, max. dim. pres. 0.092. Coil-built. Rooms N.7, N.8, and N.9. Period V.
25. Tray (P.V. X-5, pl. 30) (Fig. 7.4). Rim. H. 0.024, D. rim 0.16, max. dim. pres. 0.056. Coil-built, wheel-finished. Evidence of burning. Rooms N.7, N.8, and N.9. Period V.
26. Tray (N.S. N11-15) (Fig. 7.5). Rim. Max. H. 0.026, D. rim 0.24, max. dim. pres. 0.095. Non-local (Crete). Coil-built, wheel-finished. Room N.7 and N.8. Period V.
27. Tray (N.S. N08-01; P.V. 48, uncatalogued) (Fig. 7.5). Rim. H. 0.043, max. H. 0.143, D. rim 0.44. Coil-built. Room N.4. Period V.
28. Tray (?) (probably tripod) (N.B. N.17-47) (Fig. 7.4). Rim and base. H. 0.017, D. rim 0.19, max. dim. pres. 0.08. Hand-built. Room N.17. Period V or VI.
29. Tray (N.B. N.17-34) (Fig. 7.4). Base and curving body fragment with horizontal handle. Underside of base smoothed; near edge of vessel, scoring for attachment of another feature (wide tripod leg or ring base?). Max. H. 0.71, D. base 0.31, max. dim. pres. 0.112. Coil-built. Room N.17. Period V or VI.
30. Tripod tray or table (N.S. N06-01) (Fig. 7.5). Leg; tip broken. Max. H. 0.106, max. dim. pres. 0.087. Hand-built. Room N.6. Period VI (?).
31. Tray (N.S. N09-05) (Fig. 7.4). Rim. Max. H. 0.02, D. rim ca. 0.36, max. dim. pres. 0.095. Hand-built. Rooms N.7, N.8, and N.9. Period VI/VIIa.
32. Tray (with rounded bottom?) (N.S. N04-26) (Fig. 7.4). Rim and base; underside unsmoothed. Max. H. 0.046, D. rim 0.40, D. base 0.32–46, max. dim. pres. 0.04. Coil-built. Mat impressions (?) on base. Interior, evidence of burning. Room N.5. Period VI/VIIa (?).
33. Large tray (N.S. N12-054) (Fig. 7.5). Base. Max. H. 0.032, max. dim. pres. 0.187. Wheel-made. Room N.16. Mixed Period VI/VIIb.
34. Tray (N.B. N.20-27) (Fig. 7.4). Rim and body. Max. H. 0.02, D. rim 0.25. Coil-built. Room N.20. Period VIIa.
35. Tripod tray (A.B. 578, fig. 147) (Fig. 7.5). Leg; broken at lower half on edge. H. pres. 0.128. Hand-built. Room B.4. Period VIIb.
36. Tray (A.B. 517, fig. 142) (Fig. 7.5). Bulging, shallow rim. D. rim est. 0.33. Non-local (Cyclades). Manufacture method indeterminable. Surface badly eroded. Rooms B.2/B.3 and B.4. Period VIIb–c, few later sherds.

Non-Minoanizing cooking shapes: mainland-style cooking jars

1. Jar[7] (K.3677; Caskey 1970, 115, no. 26, fig. 4, pl. IV; P.M. VI-7, pls 11, 23; LIN 249) (Fig. 7.5).

Splaying base; mended. H. pres. 0.032, D. base 0.08. Non-local (Aegina). N.ST. LIN Mark A38. Room G.4. Period VI.

2. Jar (K.3367; P.M. VI-3, pls 11, 23; LIN 1060, pl. 52) (Fig. 7.6). Rim, handle; mended. H. pres. 0.15, D. rim est. 0.22, D. handle 0.02. Non-local (Aegina). N.ST. LIN Mark I22. Room L.21. Period VI.
3. Jar (one handled?) (W.S. 22, pl. 39) (Fig. 7.5). Profile preserved; handle missing. Slightly flaring rim, flat base. H. pres. 0.165, D. rim est. 0.11, D. base 0.064. N.ST. Evidence of burning on much of exterior. Room F.1. Period VI (–VIIa) with some VIII contamination.
4. Jar (K.2705; H.A. 593, pl. 58) (Fig. 7.6). 80% preserved, including rim, handle, conical foot; restored. H. 0.27, D. rim 0.13, D. base rest. 0.057, max. D. 0.165. N.ST. Evidence of burning on side opposite handle. Room A.17. Period VI and VII.
5. Jar (N.S. N04-27) (Fig. 7.5). Lower body, part of handle. D. base 0.05, H. pres. 0.123, max. D. pres. 0.12. Room N.5. Period VI/VIIa (?).
6. Jar (N.B. M820-01) (Fig. 7.6). 30% preserved, including rim, handle. Max. H. 0.121, D. rim 0.23–0.27, max. D. pres. 0.18. Non-local (Aegina). Coil-built. Room N.19/17. Period VIIa.
7. Jar (K.1825; H.A. 425, pl. 56) (Fig. 7.6). More than half preserved, including rim, one handle, slightly raised flat base; restored. H. 0.247, D. rim 0.143, D. base 0.084, max. D. 0.216. Coil-built, wheel-finished. Surface badly eroded; slight evidence of burning. Room A.16. Period VII.
8. Jar (K.4148; P.M. VII-17, pls 12, 26; LIN 114, pl. 7) (Fig. 7.6). High cylindrical base, bottom of body. H. pres. 0.045, D. base 0.068. Non-local (Aegina). Hand-built. Interior burnt. LIN Mark A16. Room N.11. Period VII.
9. Jar (K.3286; P.M. VII-15, pls 12, 25; LIN 139, pl. 9) (Fig. 7.6). Low conical base. H. pres. 0.065, D. base 0.067. Non-local (Aegina). N.ST. Coated inside and out with buff slip. LIN Mark A17. Room L.19. Period VII.
10. Jar (K.3230; P.M. VII-19, pls 12, 26; LIN 327, pl. 16) (Fig. 7.6). Low conical base. H. pres. 0.026, D. base 0.061. Non-local (Aegina). N.ST. LIN Mark A49. Grid square L-M 5. Period VII.
11. Jar (K.4596; LIN 447, pl. 21; W.S. 2540) (Fig. 7.6). High conical base; interior broken. D. base 0.074. Non-local (Aegina). N.ST. LIN Mark A65. Rooms W.24 and W.25. Period VII.
12. Jar (K.2496; P.M. VII-18, pls 12, 26; LIN 449, pl. 21) (Fig. 7.6). Splaying carinated base. H. pres. 0.038, D. base 0.068. Non-local (Aegina). N.ST. Evidence of burning in places. LIN Mark A65 (?). Over Rooms Z.5, Z.7. Period VII.
13. Jar. (K.2164, P.M. VII-12, pl. 47; LIN 1036, pl. 50; A.B. 159, fig. 100) (Fig. 7.6). Handle. H. pres. 0.133, D. pres. 0.088. Non-local (Aegina). Hand-built. LIN Mark I11. Room B.1. Period VIIb.
14. Jar (K.3295; P.M. VII-16, pls 12, 26; LIN 140, pl. 9) (Fig. 7.6). Low conical base; edges chipped. H. pres. 0.03, D. base 0.07. Non-local (Aegina). N.ST. Evidence of burning on the exterior. LIN Mark A17. Grid square L-M 5. Period VII, with some VIII.
15. Jar (K.4093; P.M. VII-13, pls 12, 25; H.A. 1441; LIN 1072, pl. 53) (Fig. 7.6). Shoulder with part of handle. H. pres. 0.07, D. handle 0.03. Non-local (Aegina). N.ST. LIN Mark I25. Room A.32. Period VII, with some VIII.
16. Jar (K.3796; Caskey 1970, 115, no. 21, fig. 4, pl. III; P.M. VII-14, pls 12, 25; LIN 158, pl. 9) (Fig. 7.6). High conical base; edges chipped. H. pres. 0.045, D. base 0.08. Non-local (Aegina). Coil-built. LIN Mark A20. Tower ne. Mixed Periods VII, VIII.
17. Jar (K.4631; LIN 448, pl. 21) (Fig. 7.6). High conical base. D. base 0.068. Non-local (Aegina).N.ST. LIN Mark A65 (?); dated generally to LH II. No contextual information.

Notes

1 The authors would like to thank the University of Cincinnati and the Ephorate of Antiquities of the Cyclades for permission to work on this material. We are grateful to Maria Koutsoumbou, Eleftheria Morfoniou, Eleni Tsiogka, and the staff of the Kea Museum for enabling our work. Our study of objects discussed in this paper was funded by the University of Cincinnati, INSTAP, the Archaeological Institute of America, American School of Classical Studies at Athens, and the Institute of International Education. We are grateful to Rodney Fitzsimons, Donna Crego, and John Overbeck for allowing us to discuss material from our collaborations on the Northern Sector and Period IV in this paper. We thank Julie Hruby and Debra Trusty for inviting us to contribute to this volume. Our paper was improved by the suggestions and comments of the other contributors, Julie Hruby, Debra Trusty, John Overbeck, Donna Crego, and Jeremy Rutter.

2 In the catalogue, only deviations from the standard (slightly incurving rim, flat bottom, pinched -out spout, round-section horizontal handles, and round-section legs) are noted (*e.g*. flaring rims, lugs). Entries for pots that were not studied by us (N.ST.) rely entirely on published catalog descriptions, for which some information is not available. Since most vessels are local, only non-local pots are provided with information on provenance.

3 Davis (1986, 63, 65, 67, 69) reported several other tripod legs from Period V deposits but did not catalogue them; neither have they been studied by the present authors. Thus, they are omitted from this paper.

4 Davis (1986, 58) reported but did not catalogue six additional tripod cooking pots with flaring rims.

5 Davis classifies this as Melian, but no studies have yet been able to reliably distinguish between pale -fired volcanic Melian and Theran products (Williams 1981; Papagiannopoulou *et al*. 1985; Williams and Vaughan 2007; Hilditch 2008, 283–284).

6 Davis (1986, 24, 51, 58) reported but did not catalogue several additional local trays.

7 Only variations from the standard (everted rim, vertical round-section handle attached at the shoulder) are noted in the catalogue.

8

Food and cultural identity on Kos during the Bronze Age: A typological, technological, and macroscopic fabric analysis of the storage and cooking pottery assemblage

Salvatore Vitale and Jerolyn E. Morrison

Introduction[1]

Outside of the basic purpose of food as sustanance, food is entwined within the cultural sphere, both at an individual and at a societal level. Food can be a source of power, with the ability to control its supply having significant economic and political implications (Dietler 1996; Wright 2004b; 2004c). As a symbol, food is used to celebrate events and to convey socio-political messages (Appadurai 1981). For these reasons, recent ethnographic and archaeological studies have emphasized the importance of food for the construction, negotiation, and manipulation of identity and status within a given community (Dietler 1996; Bray 2003, 3; Wright 2004b; 2004c; Lis 2017).

Within archaeology, the study of food can be approached from a variety of perspectives, including the analysis of storage, processing, preparation, consumption, and discard practices. These activities can be investigated through a wide array of methodologies, such as the examination of macrobotanical, microbotanical, and zooarchaeological remains, as well as the typological, contextual, and technological study of the ancient vessels and tools utilized in association with food.

Starting from the study of ceramics, our paper focuses on food-related practices on prehistoric Kos, with two aims: (a) to provide for the first time an overview of the local Bronze Age storage and cooking pottery assemblage; and (b) to investigate the relationships between socio-cultural changes and food storage and preparation practices during the Late Bronze Age (LBA), in particular the processes of entanglement between local, Minoan, and Mycenaean traditions on Kos (Vitale and Hancock Vitale 2010; 2013; Vitale and Trecarichi 2015; Vitale 2016a). To produce a complete picture of the evidence, two additional functional classes of materials are also considered: utilitarian ceramics related to food preparation and stone tools used

for food processing.

The analysis of the subject is divided into seven sections: (a) an introduction on the problematic nature of the data; (b) a description of the Koan Ceramic Classification System (KCCS); (c) a summary of the evidence for Koan Early Bronze Age (EBA) and Middle Bronze Age (MBA) storage and cooking pottery; (d) a phase-by-phase presentation of the Koan LBA storage and cooking pottery assemblage; (e) an examination of the main fabric and technological features of Koan EBA and LBA storage and cooking pottery; (f) a discussion of the evidence; and (g) a few final statements. (SV)

Evidence and limitations

The analysis proposed within this paper is based on the evidence recovered by L. Morricone during the 1935 to 1946 Italian excavations in the area of the Asklupis, at the settlement of the "Serraglio," and at the cemeteries of Eleona and Langada (Figs 8.1, 8.2; Morricone 1967; 1975; 1978). Since 2009, these sites and their materials have been the subject of an extensive re-study within the "Serraglio, Eleona, and Langada Archaeological Project" (SELAP),[2] a research endeavor of the Italian Archaeological School at Athens.[3] Complementary information at our disposal derives from more recent investigations by T. Marketou (1987; 1990a; 1990b; 1998; 2004; 2009; 2010) and by other Greek and British scholars (Hope Simpson and Lazenby 1970; Papazoglou 1981; Georgiadis 2003; 2009; 2012).

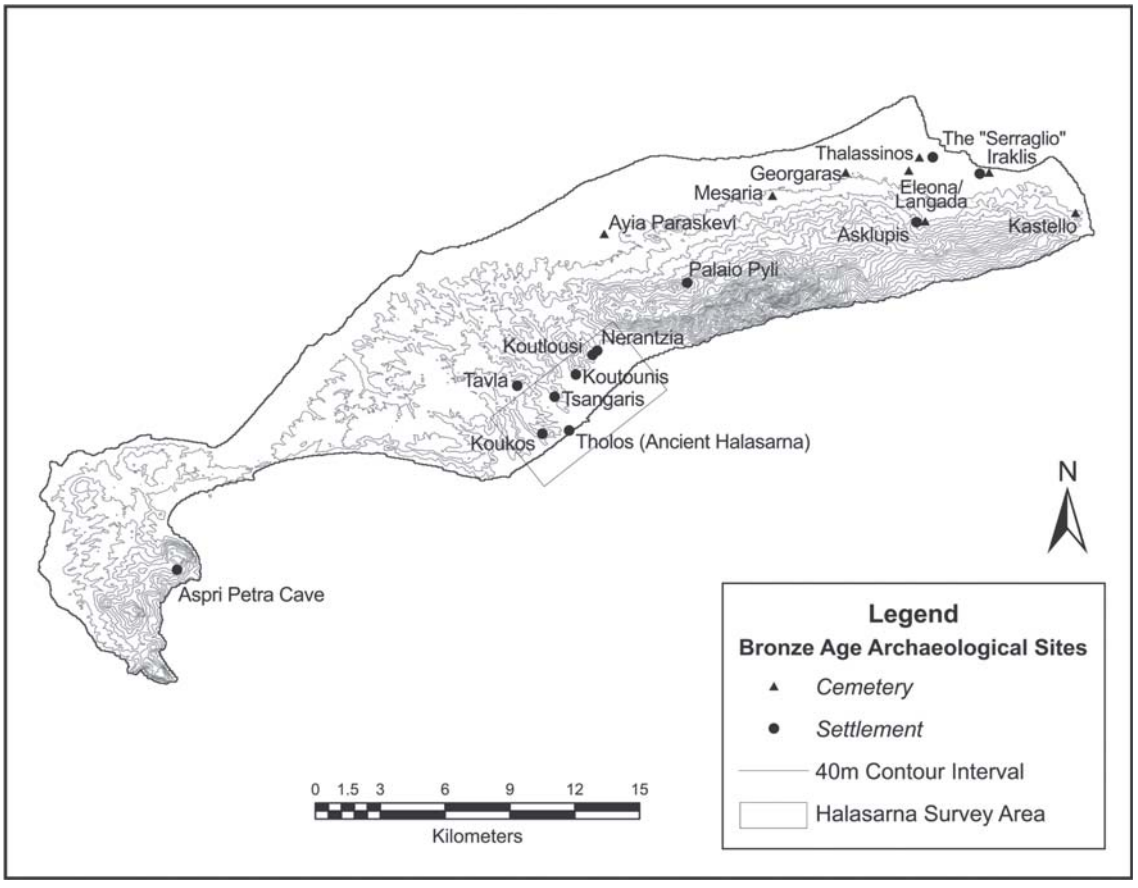


Figure 8.1. Map of Kos showing the Bronze Age sites mentioned in the text, by C. McNamee and S. Vitale

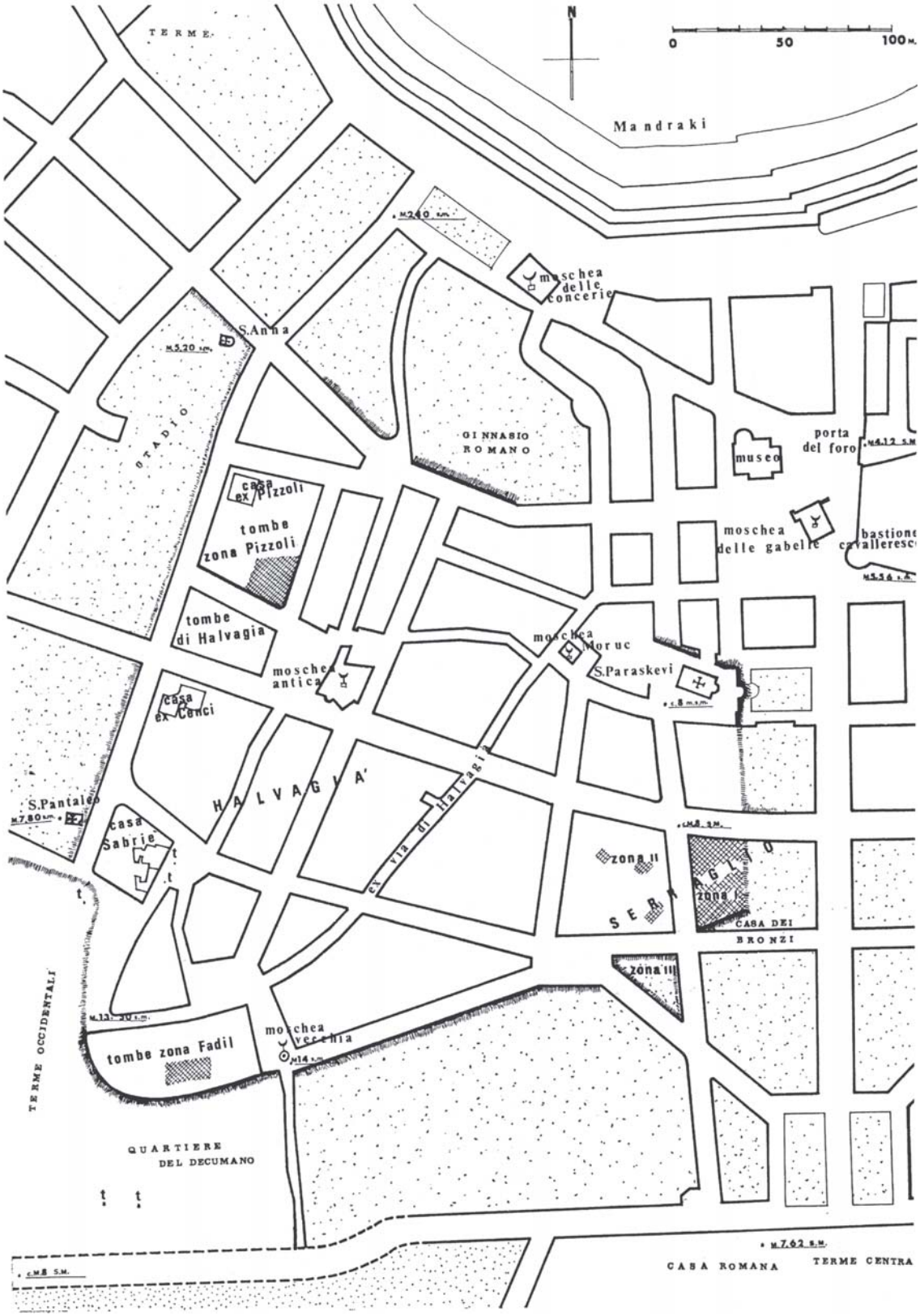
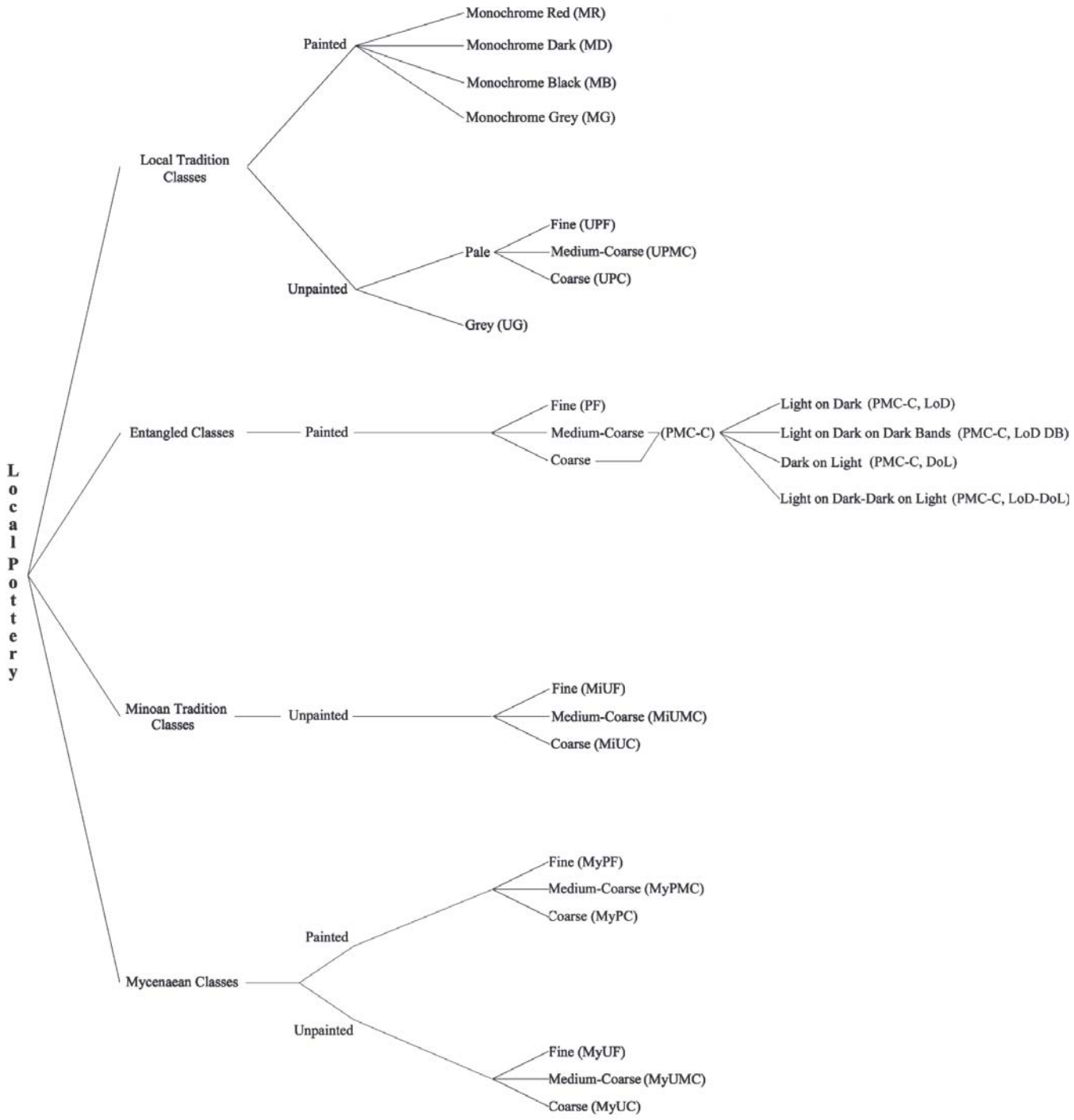


Figure 8.2. The Bronze Age settlement of the "Serraglio" with Morricone's main excavation sectors, after Morricone 1975, 152, fig. 7



Lifespan of Koan ceramic classes (Vitale in press, table 4; Vitale and Trecarichi 2015, 320, table 3):

Local Tradition Classes: EBA 2 to LH IIIC Phase 4
Entangled Classes: LBA IA Early to LBA IIIA1
Minoan Classes: LBA IA Early to LBA IB (except for conical cups that continue until LH IIIC Phase 4)
Mycenaean Classes: LBA IB/LH IIA to LH IIIC Phase 4

Table 8.1. The Koan Ceramic Classification System (KCCS)

The variable nature of these data requires analytical and interpretative caution. The materials from Morricone's investigations constitute a large collection of finds, but they exhibit important bias due to the discard strategies typical of the 1930s and 1940s. Another problematic aspect is the partial destruction of the

original field notebooks during World War II (Morricone 1967, 9 with note 1; 1975, 147–149).

Morricone's discard strategies had severe consequences for the preservation of storage, cooking, and utilitarian pottery. These classes were, as a rule, not kept, except for complete or nearly complete specimens and specific shapes of Minoan or Mycenaean origin, such as tripods, braziers, and fireboxes. Additionally, Morricone preserved vessels from closed contexts, such as floor deposits and tombs. Sherds from the 1946 sounding in the northwest corner of the "Serraglio" Zone II were also largely saved (Morricone 1975, 227–232, figs 154–160). Because of this attitude, the evidence is limited for most of the phases analyzed within this paper. This fact does not invalidate the potential contribution of storage and cooking pottery to our understanding of prehistoric Kos. However, it implies that, to comprehend socio-cultural changes on Kos during the LBA, these classes need to be examined within wider developments in the island's material culture. (SV)

Koan Ceramic Classification System (KCCS)

The materials presented here are labeled using the KCCS, which is organized according to four hierarchically applied criteria (Table 8.1; see Vitale 2013, 53–54, table 2; in press; Vitale and Trecarichi 2015, 313–315, table 1):[4] (a) pottery tradition (Local *vs*. Entangled *vs*. Minoan *vs*. Mycenaean); (b) decorative treatment (painted *vs*. unpainted); (c) color (pale *vs*. grey *vs*. red *vs*. dark *vs*. black); and (d) size of non-plastic inclusions ("fine" *vs*. "medium-coarse" *vs*. "coarse").[5]

Thus far, 22 classes have been recognized within the KCCS. Local Tradition ceramics are characterized by a preference for biconical profiles, slit or grooved handles, handle attachments on the neck rather than on the rim of closed shapes, burnished or wiped surfaces, monochrome decorative schemes on painted pottery, and plastic bands to decorate extensive parts of the vessel body and/or to emphasize critical structural transitions (Vitale 2013, 55; Vitale and Trecarichi 2015, 328–329). Minoan and Mycenaean Tradition classes include Cretan or Greek Mainland shapes, which were manufactured locally on Kos. Entangled classes merged Local Tradition and Minoan-type features in a new stylistic language.[6] (SV)

Early and MBA

During the EBA and MBA, the main characteristics of the Koan Local Tradition were elaborated. Within these phases, Kos shared significant cultural features with other sites in the Dodecanese, west coastal Anatolia, and the Aegean islands located in the vicinity of the Anatolian coast. This fact is shown by parallels in settlement strategies, burial practices, and the pottery repertoire (Marketou 1990b, 43–44; 2004, 20, 25–27; 2010, 762–763; Vitale 2013, 61; Vitale and Trecarichi 2015, 313, 320, table 3). Contacts with Crete and the Greek Mainland were limited, with imports from these regions representing less than 1% of the overall ceramic assemblage.

Available evidence for storage and cooking pottery during the EBA and MBA is basically limited to the first of these two phases and comes mostly from the Asklupis area (Fig. 8.1). Here, fragments from Unpainted Pale Coarse (UPC) or Monochrome Dark (MD) pithoi (Table 8.2, nos 01–09; Fig. 8.3a–c) and UPC or Unpainted Pale Medium-Coarse (UPMC) tripod cooking pot legs (Table 8.2, nos 10–14; Fig. 8.3d–h) were found by Morricone and Hope Simpson and Lazenby in mixed contexts (Hope Simpson and Lazenby 1970, 57; Morricone 1975, 262). No obvious cooking vessels were recovered in the four Asklupis tombs excavated by Morricone (Morricone 1975, 261–271, figs 210–223). However, the burning marks on the lower body of an Unpainted Pale Fine (UPF) small jar and on the rim and the interior surface of an UPMC dipper (Table 8.2, nos 15–16; Fig. 8.3i–j) from Tomb 2 might suggest that both could also have been utilized in cooking activities, although their primary function would have been storage and ladling respectively (Vitale 2013,

55–57, fig. 5:1–2, table 3). Fragments of EBA storage and tripod cooking pots were also recovered in the Halasarna region during a later survey project (Fig. 8.1; Georgiadis 2009, 11; 2012, 59–60, fig. 17).

All of the EBA storage and cooking ceramics from the Asklupis and the Halasarna area appear to be locally made and to belong to the Local Tradition assemblage. Most of the materials from the Asklupis date to the Koan EBA 1–2 phases, corresponding to Early Helladic (EH)/Early Cycladic (EC)/Early Minoan (EM) I-IIA (Vitale 2013, 57–61, table 4). The ceramics from the Halasarna area date between EBA 2 and EBA 3A, corresponding to EH/EC/EM IIA-IIB (Vitale 2013, 61–62, table 4). (SV)

LBA

Settlement preceding City I: LBA IA Early–LBA IA Mature

At the "Serraglio" (Figs 8.1, 8.2), the settlement preceding City I is divided into two sub-phases, dating to LBA IA Early and Mature (Table 8.3). The former marks a significant increase in the contacts with Crete, while the latter is characterized by the peak of the process of Minoanization of the island and the first appearance of Mycenaean pottery imports (Vitale and Hancock Vitale 2010, 65–74; 2013, 47–55; Vitale 2016a). Minoan cultural diacritics on Kos during LBA IA Early and Mature occur within the architectural, weaving equipment, and ceramic repertoires. On the whole, however, the material culture of the "Serraglio" retains an indigenous character reaching back to the west coastal Anatolian traditions of the EBA and MBA. In this respect, it is particularly impressive that five of the LBA IA Early and Mature ceramic classes, including "Monochrome Red" (MR), MD, UPF, UPMC, and UPC pottery are attested on Kos at least since the EBA 1–2 phases and continue to be produced until the end of the LBA (Table 8.1; Vitale 2013, 55, tables 2–3, figs 4–7; Vitale and Trecarichi 2015, 320, table 3).

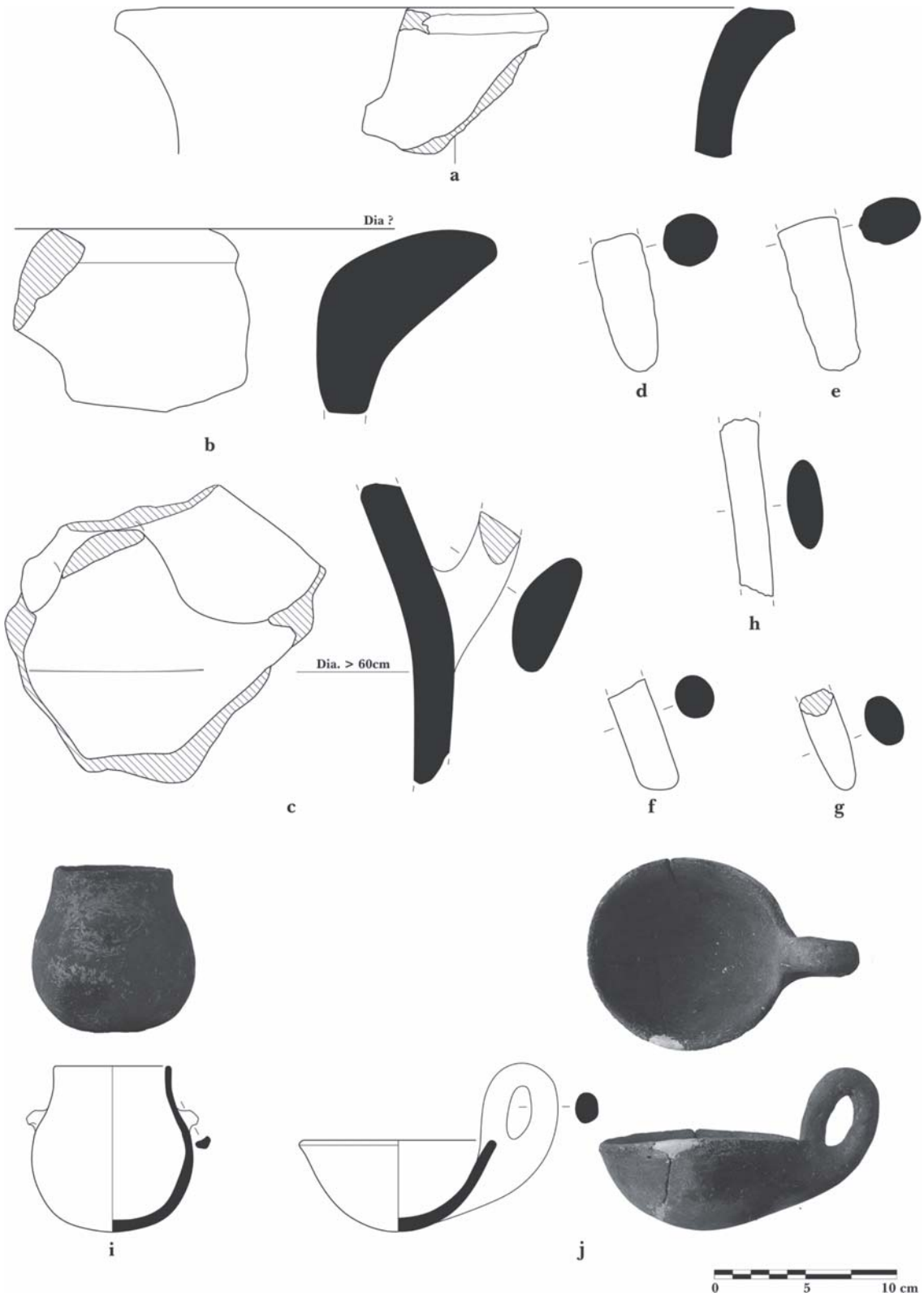


Figure 8.3. EBA pots from the Asklupis: a–c. EBA 1–2: UPC pithoi from the Asklupis; d–h. EBA 1–2: UPC and UPMC tripod legs from the Asklupis; i. EBA 2: UPF jar from the Asklupis Tomb 2, no. 1270; j. EBA 2: UPMC dipper from the Asklupis Tomb 2, no. 1271; a–b, d–e: M. Rossin and T. Ross; c, f–h: S. Regio and T. Ross; i: drawing, M. Rossin and A. Trecarichi; photo, S. Vitale; j: drawing, S. Regio, M. Rossin, and A. Trecarichi; photos, S. Vitale

Table 8.2. Catalog of analyzed ceramic vessels

No.	*Shape*	*Date*	*KCCS*	*Forming technique*	*Fabric sub-group*	*Macroscopic cat. no.*	*Fig. no.*
01	Pithos	EBA 1–2	UPC	FHM	B-III	JEM_193	8.3a
02	Pithos	EBA 1–2	UPC	FHM (CB)	C-II	JEM_001	8.3b
03	Pithos	EBA 1–2	UPC	FHM	C-II	JEM_002	8.3c
04	Pithos	EBA 1–2	UPC	FHM	C-II	JEM_003	Not illustrated
05	Pithos	EBA 1–2	UPC	FHM	C-II	JEM_022	Not illustrated
06	Pithos	LN/FN–EBA 2	MD	FHM	C-II	JEM_005	Not illustrated
07	Pithos	LN/FN–EBA 2	UPC	FHM	C-II	JEM_007	Not illustrated
08	Pithos	LN/FN–EBA 2	UPC	FHM	C-II	JEM_006	Not illustrated
09	Pithos	LN/FN–EBA 2	UPC	FHM	C-III	JEM_032	Not illustrated
10	Tripod cooking pot	EBA 1–2	UPC	NA	C-II	JEM_012	8.3d
11	Tripod cooking pot	EBA 1–2	UPC	NA	C-IV	JEM_013	8.3e
12	Tripod cooking pot	EBA 1–2	UPMC	NA	B-III	JEM_195	8.3f
13	Tripod cooking pot	EBA 1–2	UPC	NA	C-II	JEM_189	8.3g
14	Tripod cooking pot	EBA 1–2	UPMC	NA	C-II	JEM_014	8.3h
15	Small jar (no. 1270)	EBA 2	UPF	FHM	C-IV	JEM_036	8.3i
16	Dipper (no. 1271)	EBA 2	UPMC	FHM	C-IV	JEM_035	8.3j
17	Pithos	LBA IA Early–Mature	UPC	FHM	B-IX	JEM_125	8.4a; 8.11b
18	Pithoid jar	LBA IA Early–Mature	MC LoD DB	HM + CB-WF	B-V	JEM_101	8.4b; 8.12a
19	Pithoid jar (no. 1196)	LBA IA Mature	MC LoD DB	HM + CB-WF	B-V	JEM_250	8.4c
20	Pithoid jar	LBA IA Early	C LoD	FHM	B-IX	JEM_251	8.4d; 8.11a
21	Pithoid jar	LBA IA Mature	MC DoL	CB-WF	B-XI	JEM_252	8.4e
22	Pithoid jar	LBA IA Mature	MC DoL	CB-WF	B-V	JEM_253	8.4f
23	Cooking jar (no. 1207)	LBA IA Early–Mature	UPC	CB-WF	B-IX	JEM_234	8.5a
24	Cooking jar (no. 1213)	LBA IA Early–Mature	UPC	HM + CB-WF	B-VII	JEM_235	8.5b; 8.12b
25	Cooking pot lid	LBA IA Early–Mature	UPMC	CB-WF	B-IX	JEM_236	8.5c; 8.11c
26	Tripod cooking pot	LBA IA Mature	MiUMC	CB-WF	B-IX	JEM_175	8.5d
27	Tripod cooking pot	LBA IA Mature	MiUMC	NA	B-IX	JEM_237	8.5e
28	Jar	LBA IA Mature	UPMC	NA	B-IX	JEM_080	8.5f
29	Brazier (no. 1357)	LBA IA Mature	MiUMC	NA	B-IX	JEM_072	8.5g
30	Brazier (no. 1359)	LBA IA Mature	MiUMC	CB-WF?	B-IX	JEM_070	8.5h
31	Brazier (no. 1356)	LBA IA Mature	MiUMC	CB-WF	B-VII	JEM_071	8.5i; 8.11d
32	Pithos (no. 1201)	LBA IB	MD	HM + CB-WF	B-IX	JEM_238	8.6a
33	Cooking jug (no. 1237)	LBA II-LBA IIIA1	MD	CB-WF	B-IX	JEM_239	8.7a
34	Spouted tripod cooking pot (no. 1231)	LBA II-LBA IIIA1	UPMC	CB-WF	B-VI	JEM_240	8.7b
35	Pithos	LH IIIA2-LH IIIB1	UPC	CB-WF	B-IX	JEM_132	8.7c

36	Cooking jar	LH IIIA2-LH IIIB1	UPMC	CB-WF	B-IX	JEM_161	8.7d
37	Cooking jug/amphora FS 65/66	LH IIIA2-LH IIIB1	MyUMC	NA	B-IX	JEM_174	8.7e
38	Tripod cooking pot FS 320	LH IIIA2-LH IIIB1	MyUMC	CB-WF	B-VII	JEM_159	8.7f
39	Cooking jug/amphora FS 65/66	LH IIIA2-LH IIIC	MyUMC	CB-WF	B-VII	JEM_160	8.8a
40	Cooking jug/amphora FS 65/66	LH IIIA2-LH IIIC	MyUMC	WT	B-IX	JEM_241	8.8b
41	Cooking jug/amphora FS 65/66	LH IIIA2-LH IIIC	MyUMC	CB-WF	B-IX	JEM_131	8.8c
42	Tripod cooking pot FS 320	LH IIIA2-LH IIIC	MyUMC	WT	B-IX	JEM_242	8.8d; 8.12c
43	Tripod cooking pot FS 320	LH IIIA2-LH IIIC	MyUMC	NA	B-IX	JEM_156	8.8e
44	Tripod cooking pot FS 320	LH IIIA2-LH IIIC	MyUMC	NA	B-IX	JEM_243	8.8f
45	Tripod cooking pot FS 320	LH IIIA2-LH IIIC	MyUMC	NA	B-IX	JEM_244	8.8g
46	Tripod cooking pot FS 320	LH IIIA2-LH IIIC	MyUMC	NA	B-IX	JEM_157	8.8h
47	Tripod cooking pot FS 320	LH IIIA2-LH IIIC	MyUMC	NA	B-IX	JEM_158	8.8i
48	Tripod cooking pot FS 320	LH IIIA2-LH IIIC	MyUMC	CB-WF?	B-IX	JEM_155	8.8j
49	Tripod cooking pot FS 320	LH IIIA2-LH IIIC	MyUMC	NA	B-IX	JEM_245	8.8k
50	Tripod cooking pot FS 320	LH IIIA2-LH IIIC	MyUMC	NA	B-VI	JEM_247	8.8l
51	Tripod cooking pot FS 320	LH IIIA2-LH IIIC	MyUMC	NA	B-XI	JEM_249	8.8m
52	Tripod cooking pot FS 320	LH IIIA2-LH IIIC	MyUMC	CB-WF	B-IX	JEM_248	8.8n; 8.12d

Abbreviations for forming techniques: CB=coil-built, FHM=fully handmade, WF=wheel-fashioned, WT=wheel-thrown, NA=not assessable (when no portion of the vessel body is preserved or the preserved portion is not well enough preserved to make an assessment).

During LBA IA Early and Mature, storage and cooking pottery is represented by a relatively small group of specimens, none of which comes from a closed context, with a single noticeable exception from Zone III at the Serraglio (Morricone 1975, 190–191, figs 76–77). Storage vases belong to the Local and the Entangled traditions (Table 8.2, nos 17–22; Fig. 8.4). Entangled specimens are characterized by a variety of Medium-Coarse to Coarse (MC-C) pithoid jars, decorated in the Light on Dark (LoD), Dark on Light (DoL), or LoD-DoL techniques (Vitale 2007a, 76–193; Vitale and Hancock Vitale 2010, 68–70; 2013, 50–52, all with previous bibliography). In terms of morphology, shape, and function, MC-C LoD/DoL pithoid jars are fully embedded in the Koan Local Tradition, as shown by the occurrence of biconical profiles and slit or grooved handles (Table 8.2, nos 18–19, 21; Fig. 8.4b–c, e). The decoration, however, combines Minoan motifs, such as leaves, crescents, foliate bands, concentric arcs, spirals, and reeds, Minoan techniques, such as the use of the LoD, DoL, and LoD-DoL decoration, and local idiosyncrasies, such as the ubiquitous use of single and double wavy lines (Table 8.2, nos 18–22; Fig. 8.4b–f).

Turning to cooking pottery, two complete UPC jars from the “Serraglio” Zone II (Table 8.2, nos 23–24; Fig. 8.5a–b) can be assigned to the Local Tradition, as suggested by the biconical profile of both vessels and the occurrence of slit handles and a plastic belly band in the case of jar no. 24 (Fig. 8.5b). A large fragment from an UPMC cooking pot lid (Table 8.2, no. 25; Fig. 8.5c) should also be assigned to the Local Tradition repertoire, while Cretan types are documented by two locally made flat-bottomed tripod cooking pots (Table 8.2, nos 26–27; Fig. 8.5d–e), which can be assigned to the Minoan Unpainted Medium-Coarse (MiUMC) class. Finally, Local Tradition utilitarian shapes related to cooking activities are represented by an UPMC jar handle (Table 8.2, no. 28; Fig. 8.5f), while Cretan utilitarian types include three MiUMC braziers (Table 8.2, nos 29–31; Fig. 8.5g–i). (SV)

Figure 8.4. Pithos and pithoid jars from the "Serraglio": a. LBA IA Early-Mature: UPC pithos; b. LBA IA Early–Mature: MC LoD DB pithoid jar; c. LBA IA Mature: MC LoD DB pithoid jar no. 1196; d. LBA IA Early: C LoD pithoid jar; e. LBA IA Mature: MC DoL pithoid jar; f. LBA IA Mature: MC DoL pithoid jar; a: S. Regio and T. Ross; b, e, f: A. Caputo; c: S. Regio, M. Rossin, and T. Ross; d: M. Rossin and T. Ross

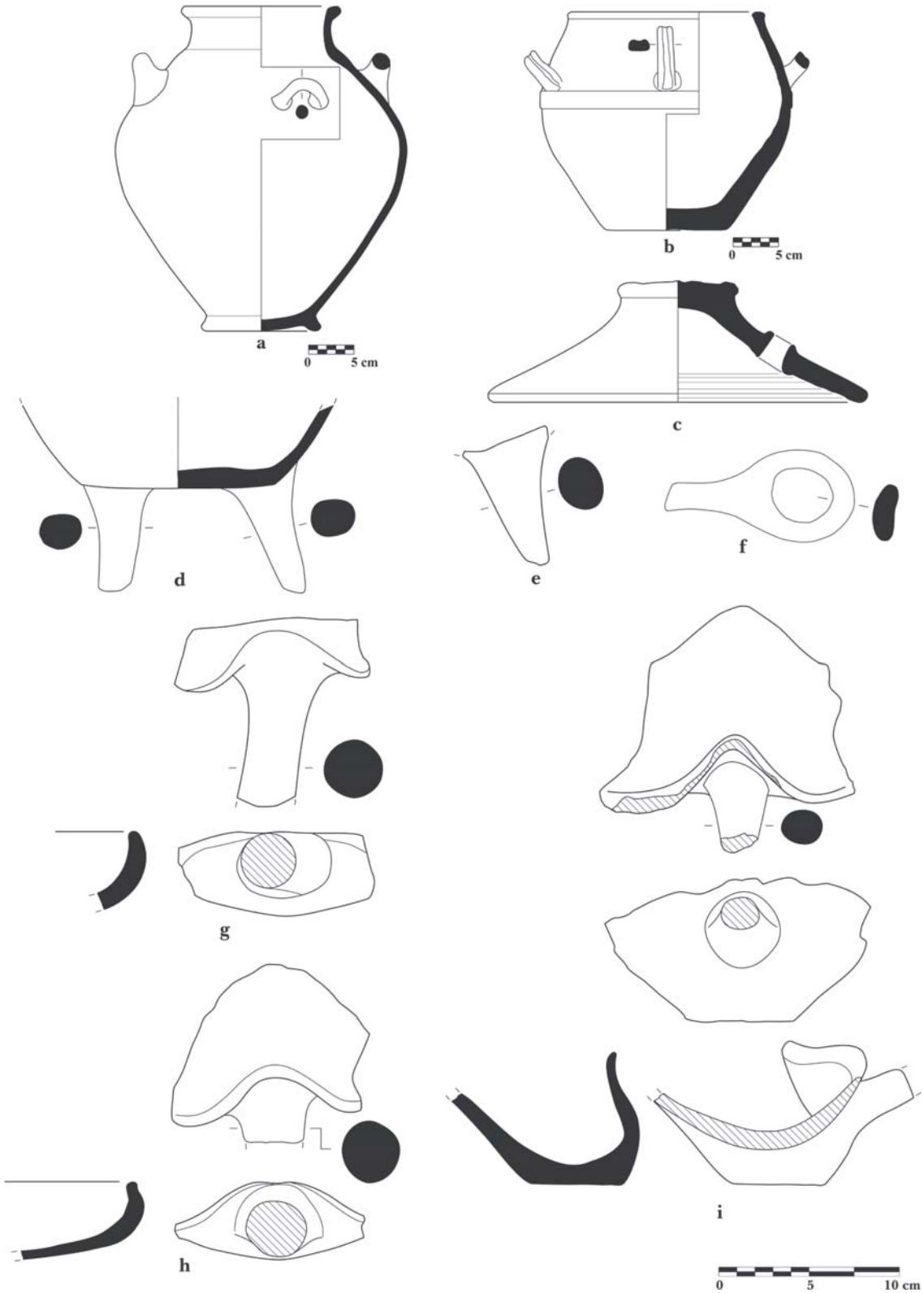


Figure 8.5. Cooking and utilitarian pots from the "Serraglio": a. LBA IA Early–Mature: UPC cooking jar no. 1207; b. LBA IA Early–Mature: UPC cooking jar no. 1213; c. LBA IA Early–Mature: UPMC cooking pot lid; d–e. LBA IA Mature: MiUMC tripod cooking pots; f. LBA IA Mature: UPMC utilitarian jar; g–i. LBA IA Mature: MiUMC braziers nos 1357, 1359, 1356; a, e: M. Rossin and T. Ross; b: M. Rossin and A. Caputo; c: M. Rossin and T. Ross; d: M. Rossin and A. Trecarichi; f: S. Regio and A. Trecarichi; g–i: S. Regio, M. Rossin, and T. Ross

City I: LBA IB

During LBA IB, imports from Crete are still attested on Kos (Morricone 1975, 328–330, fig. 318; Marketou 1987), but there is a stagnation of cultural entanglements between Local and Minoan Traditions, which were characteristic of the LBA IA phase, suggesting a decrease in the influence exerted by Cretan ceramic models. In fact, LBA IB is characterized by an increase of pottery imports from the Greek Mainland and the appearance of locally produced Mycenaean vases at the "Serraglio" (Morricone 1975, 175–176, fig. 58; Vitale and Trecarichi 2015, 329, note 25). The majority of the Koan material culture continues to have an overall indigenous character (Vitale and Hancock Vitale 2010, 74–75; Vitale 2016a).

Unfortunately, no cooking pots can be securely attributed to LBA IB. The only information on the interplay between food and Koan material culture comes from storage vessels and ground stone tools. Storage vessels included Local Tradition UPC and MD pithoi (Table 8.2, no. 32; Fig. 8.6a; Morricone 1975, 160–162, 248, figs 24–28, 193), as well as Entangled MC-C LoD/DoL pithoid jars. Evidence for the latter, however, comes from imported specimens found at Trianda on Rhodes rather than directly on Kos (Papazoglou-Manioudaki 1982, 154, no. 41, pl. 67:α). The ground stone tools included a peperino oval slab and a marble deep bowl with lug handles (Fig. 8.6b–c). The former may have been a local product, while the latter, which is reminiscent of P. Warren's Type D (1969, 30), may have been an import. In addition to these two tools, this deposit also contained an imported Minoan-type lamp in red marble (Fig. 8.6d), comparable to Warren's Group IIA (1969, 52–53). Both the pithoi and the ground stone tools came from *in situ* floor deposits (Morricone 1975, 158–162, 211–212, 220–221, 247–248, figs 24–28, 121–122, 126–127, 128:b, 142, 192–193; Vitale 2006, 79, fig. 6). (SV)

City II: LBA II–LBA IIIA1

Morricone's City II at the "Serraglio" had two sub-phases, one bridging LBA II and LBA IIIA1, the other dating to LBA IIIA1 (Morricone 1975, 391–392; Vitale 2006, 87). City II is characterized by an increase in Mycenaean ceramic imports, the local production of Mycenaean pottery on a larger scale, and the initial use of the chamber tomb cemetery of Eleona (Fig. 8.1), *ca*. 750 m to the southwest of the "Serraglio" (Morricone 1967, 34–35, 55–57, 69–72, figs 7–8, 26–28, 42–43; Vitale and Hancock Vitale 2010, 75; Vitale and Trecarichi 2015, 329). The establishment of the Eleona cemetery is important, as it implies the introduction on Kos of Mycenaean architecture, burial offerings, and funerary practices. The overall character of the material culture at the "Serraglio", however, continues to show significant Local Tradition features (Vitale 2006, 81–82, figs 9–11).

During the earlier sub-phase of City II, interesting contextual evidence for food storage and preparation practices comes from *Vano* A, *Vano* C, and Court B, three interconnected structures situated in the "Serraglio" Zone II. Two pithoi and two cooking pots were recovered from these structures (Morricone 1975, 209–216, figs 221–226, 229–231; Vitale 2006, 81–83, figs 9–12). The cooking pots were a MD jug and an UPMC spouted tripod (Table 8.2, nos 33–34; Fig. 8.7a–b). Although these vases may be reminiscent of Mycenaean Furumark Shapes (FS) 65 and 320 (Furumark 1941), they both can be assigned to the Local Tradition. In fact, the jug has a monochrome decorative treatment and an idiosyncratic body characterized by a stemmed foot and a biconical profile. The tripod has a peculiar spout and again a biconical profile. The two pithoi were lost during World War II. According to Morricone's descriptions (1975, 213, note 3, 215), however, it seems that both belonged to the Local Tradition assemblage.

The production of Entangled MC-C LoD/DoL classes came to an end during LBA IIIA1 (Vitale and Hancock Vitale 2010, 75; Vitale 2016a). It is unclear, however, whether pithoid jars were ever manufactured within these classes after LBA IB (see Papazoglou-Manioudaki 1982, 154, no. 41, pl. 67:α). (SV)

Cities III and IV: Late Helladic (LH) IIIA2–LH IIIB and LH IIIC

City III, dating from LH IIIA2 to LH IIIB, and City IV, dating to LH IIIC Phases 1–5 (Table 8.3), represent a long time period. They also encompass diverse socio-political situations, such as the Palatial and Post-Palatial phases of the Mycenaean civilization. Nevertheless, despite the risk of oversimplification, they are discussed together here because they share a significant number of homogeneous features in relation to the subject of our paper.

During Cities III and IV, Mycenaean material culture became predominant on Kos (Vitale 2016a). Mycenaean-type chamber or tholos tombs were located at Ayia Paraskevi, Mesaria, Eleona, Langada, Iraklis, Kastello, and in the properties of Georgaras and Thalassinos (Fig. 8.1; Morricone 1967; Georgiadis 2003, 82–83; Marketou 2010, 765). The Local Tradition ceramic repertoire was enlarged by the appearance of Monochrome Grey, Monochrome Black (MB), and Unpainted Grey classes (Table 8.1; Vitale and Trecarichi 2015, 320, tables 1, 3). However, despite long coexistence, interaction between Local Tradition and Mycenaean pottery remained relatively limited (Vitale and Trecarichi 2015, 329–331). Contacts with Crete are documented by a continuous series of ceramic imports and by the incorporation, especially during LH IIIA2 and LH IIIB, of several Minoan features within the locally produced Mycenaean fine decorated pottery assemblage (Mountjoy 1999, 1087, 1002–1003, 1116, nos 21, 84–86, figs 443, 450–451).

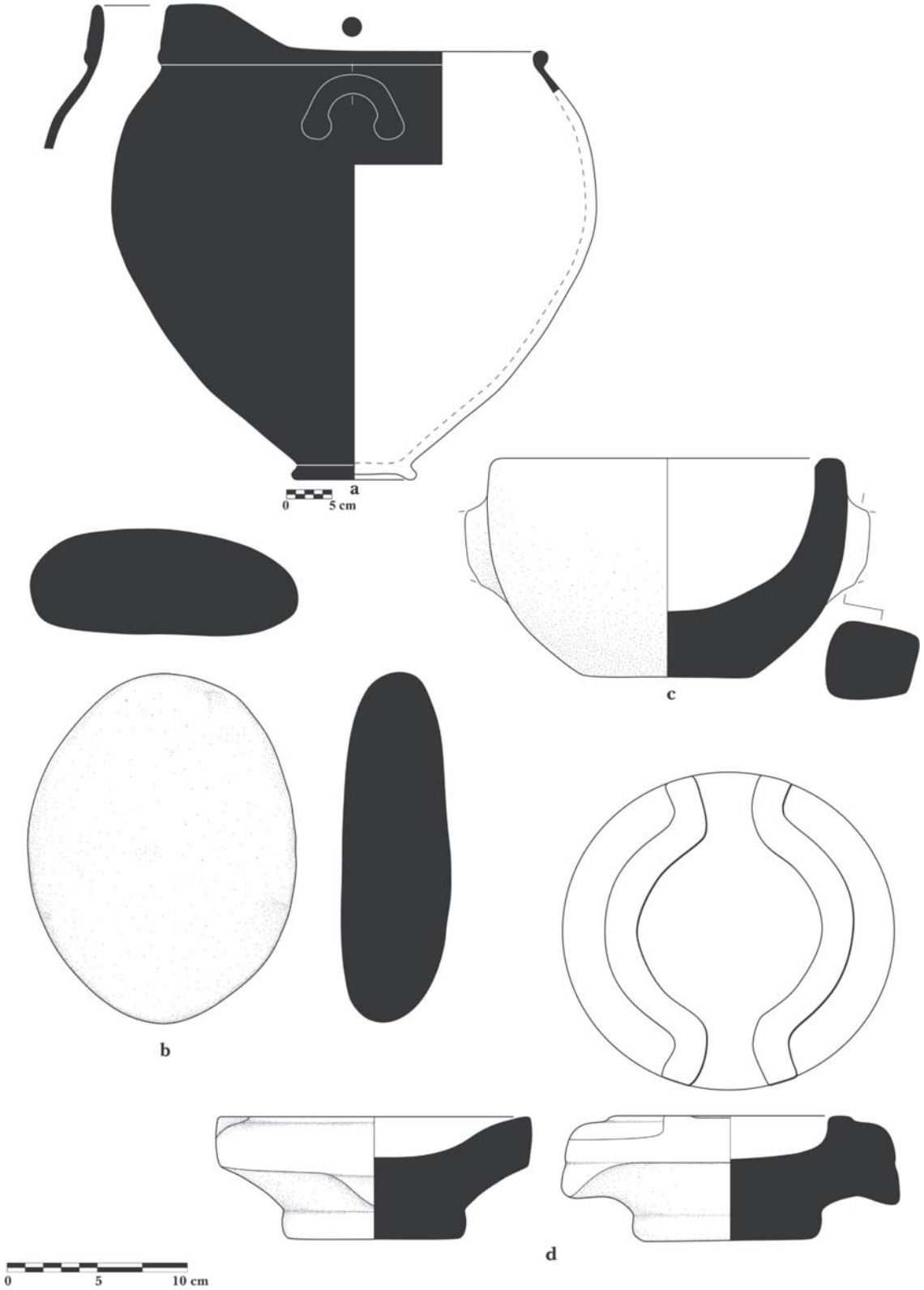


Figure 8.6. Pithos and stone tools from the "Serraglio": a. LBA IB: MD pithos no. 1201; b. LBA IB: Peperino oval slab from the sounding underneath Vano *A (Zone II); c. LBA IB: Marble deep bowl from the sounding underneath* Vano *A (Zone II); d. LBA IB: Minoan-type stone lamp from the sounding underneath* Vano *A (Zone II); a: S. Regio and T. Ross; b: A. Trecarichi and T. Ross; c–d: M. Rossin and T. Ross*

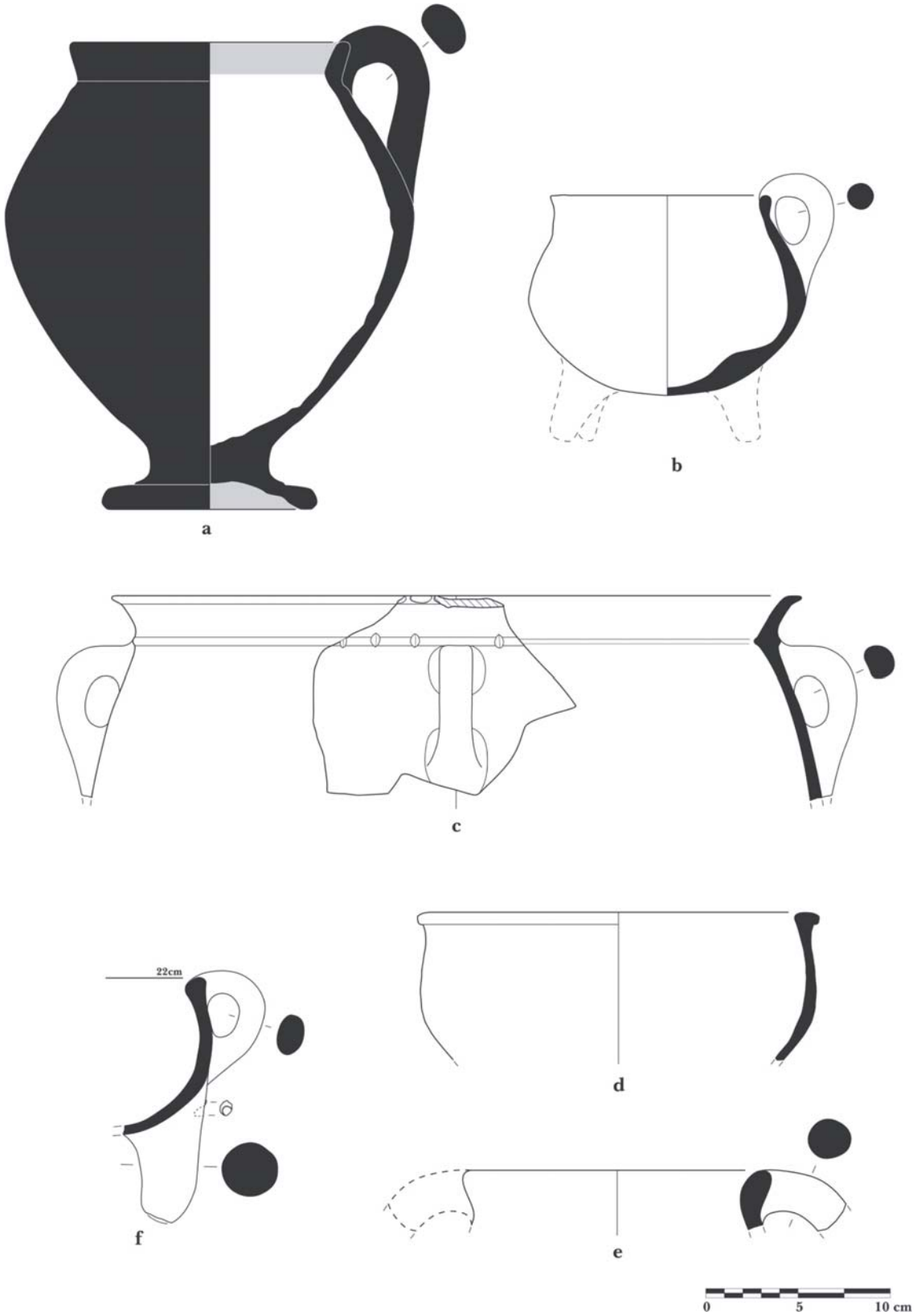


Figure 8.7. Cooking and storage vessels from the "Serraglio": a. LBA II–LBA IIIA1: MD cooking jug from Vano *C, no. 1237; b. LBA II–LBA IIIA1: UPMC spouted tripod cooking pot from Court B, no. 1231; c. LH IIIA2–LH IIIB1: UPC pithos from the fill underneath the House of the Figs; d. LH IIIA2–LH IIIB1: UPMC cooking jar from the fill underneath the House of the Figs; e. LH IIIA2–LH IIIB1: MyUMC cooking jug/amphora FS 65/66 from the fill underneath the House of the Figs; f. LH IIIA2–LH IIIB1: MyUMC tripod cooking pot FS 320 from the fill underneath the House of the Figs; a: A. Caputo; b: S. Regio and A. Trecarichi; c, e–f: S. Regio and T. Ross; d: M. Rossin and T. Ross*

The best evidence for Koan storage and cooking ceramics during Cities III and IV comes from two fills, one underneath and the other above the floor of the House of the Figs (Morricone 1975, 229–231, figs 154, 158–159; Vitale 2006, 83–85, fig. 13). The former can be dated between LH IIIA2 and LH IIIB1, while the latter can be assigned mostly to LH IIIC, although both contain a certain amount of intrusive later material. Storage pottery corresponds to 43 specimens in the earlier of these fills (20.1% of the total) and seven in the later (2.7% of the total). Cooking pottery includes 13 specimens during LH IIIA2 to LH IIIB1 (6.1% of the total) and 26 during LH IIIC (10.0% of the total). These numbers suggest that the currently preserved sample may represent the result of a partial selection after excavation.

The storage pottery from both fills is entirely based in the Local Tradition, including UPMC, MD, and MB vessels (Table 8.2, no. 35; Fig. 8.7c).[7] The LH IIIA2 to LH IIIB1 cooking pottery from the fill underneath the House of the Figs floor included two Local Tradition UPMC specimens (15.4%; Table 8.2, no. 36; Fig. 8.7d), two Mycenaean Unpainted Medium-Coarse (MyUMC) specimens (15.4%; Table 8.2, nos 37–38; Fig. 8.7e–f), in addition to nine fragments (69.2%) that could not be assigned with certainty to any tradition. On the other hand, the LH IIIC cooking pottery from the fill above the floor of the House of the Figs contained 19 MyUMC specimens (73.2%), six Local Tradition specimens, including five MD (19.2%) and one UPMC (3.8%) vessels, as well as one specimen (3.8%) that could not be assigned with certainty to any tradition.

In addition to the materials from the fill underneath the House of the Figs, several pithoi were found *in situ* within the structures of Cities III and IV (Morricone 1975, 163–166, 179, 185, figs 31, 36). Although these vases were lost during World War II, based on Morricone's excavation pictures, they seem to belong to Local Tradition types because of their biconical profiles. Finally, several unstratified MyUMC cooking pottery sherds may be tentatively assigned between LH IIIA2 and LH IIIC Phase 5, due to typological parallels with other ceramic deposits in the Aegean (Lis 2012b, 203–220). Attested shapes include cooking jugs/amphoras FS 65/66 (Table 8.2, nos 39–41; Fig. 8.8a–c) and tripods FS 320 (Table 8.2, nos 42–52; Figure 8.8d–n). Among the latter, a leg with an Aeginetanizing profile also occurs (Table 8.2, no. 51; Fig. 8.8m). (SV)

Macroscopic fabric analysis and manufacturing techniques

Thus far, *ca*. 1000 Koan fragments have been examined within SELAP using macroscopic methods (Moody *et al*. 2003). Within this sample, more than 250 specimens received a macroscopic fabric analysis (MACFA) number and an individual detailed description. The aim of this study is to define the local and imported fabrics used from the Late/Final Neolithic (LN/FN) to the Late Protogeometric, to record surface irregularities that could be marks of vessel production, and to investigate the interplay between fabrics, technology, and identity on Kos during these phases. (JEM)

SELAP's macroscopic fabric groups: an overview

SELAP's macroscopic fabric groups are defined based on paste characteristics, as well as the density and types of non-plastic inclusions, soft inclusions, and voids within the paste (Tables 8.4, 8.5). The density of non-plastic inclusions to the paste ranges from a "fine" to a "very coarse clay body". The use of these terms for macroscopic fabric analysis does not correspond to the use of the terms "fine", "medium-coarse", and "coarse" in the context of the KCCS described above (Table 8.1), which refers exclusively to the grain size of the inclusions, regardless of the density to paste factor.

The Koan local assemblage is divided into four broad macroscopic fabric groups, each indicated by a letter of the alphabet from A to D.[8] All of these groups have further internal subdivisions based on the paste

granularity of the dominant inclusions and the arrangement of non-plastic inclusions within the paste.[9] These subdivisions are organized to highlight subtle differences that potentially indicate material processing by the ancient potters to create clay bodies.

Preliminary work on the raw clays and rock tempers collected by SELAP's geologists, I. Iliopoulos and K.-S. Passa, and the author of this section indicates that all of the local Late and Final Neolithic, Bronze Age, and Protogeometric vessels in SELAP's collection were produced using materials found in close proximity to the modern town of Kos and associated with metavolcanic rocks.[10] Moreover, many of the local fabric groups have components (*e.g.* non-plastic inclusions, soft inclusions, and voids) that suggest that the ancient potters in all of the phases examined could have practiced material manipulation, such as clay mixing and tempering the clays with inorganic and organic materials.

All of the 52 specimens examined in this paper are presumably locally made (Table 8.2). The chronological placement of the fabrics used for storage, cooking, and cooking-related utilitarian ceramics indicates that there were multiple medium, coarse, and very coarse metavolcanic fabric mixes in both the EBA and the LBA periods. (JEM)

Fabric mixes and their chronological meaning

The storage, cooking, and utilitarian pots analyzed in this paper fall into nine sub-groups, which belong to fabric Groups B and C: B-III, B-V, B-VI, B-VII, B-IX, B-XI, C-II, C-III, and C-IV (Tables 8.2, 8.5; Figs 8.9, 8.10). Generally speaking, Groups B and C are poorly-sorted to moderately-sorted non-micaceous fabrics comprised of metamorphic-igneous sand, such as possible quartz, feldspar, tuff or pumice, "gold" and "silver mica", and accessory minerals like hornblende, phyllite, limestone, and calcite (Tables 8.4, 8.5). The non-plastic inclusions typically measure 1–2mm, but occasionally may measure 3mm or more (Tables 8.4, 8.5).

*Table 8.3. Reassessment of Morricone's building phases and chronology of significant pottery deposits from the "Serraglio"**

Morricone 1975	*Building phases*	*Height asl of the main floors/surfaces (ASL) (Morricone 1975, 252, 384–394)*		*Marketou 1990a; Vitale 2006; Vitale 2012a*	*Most significant deposits***
		Serraglio	*Fadil Zone*		
MBA/Middle Minoan (MM) III	Settlement Preceding City I, First Sub-Phase	Unknown (below +4.65 m)	Unknown (below +10.0 m)	LBA IA Early (= Late Minoan IA Early–Advanced*** or traditional Middle Minoan IIIB; Akrotiri's seismic destruction)	Serraglio: Zone I, *Vano* A (June 1942); Serraglio: Zone, *Vano* Z (June 1942).
	Settlement Preceding City I, Second Sub-phase			LBA IA Mature (= Late Minoan IA Final*** or traditional Late Minoan IA; Akrotiri's volcanic destruction)	Serraglio: Zone I, sounding underneath City I walls (November 6, 1940).
MBA III–LBA I or LBA I	City I	*ca.* +5.55 m	*ca.* +10 m	LBA IB	Serraglio: Zone I, room beside Tomb 11 resting level (May 1936); Serraglio: Zone II, sounding underneath *Vano* A first floor (November 1941); Serraglio: Zone II, sounding underneath Court B floor level (November 1941).
LBA IIIA (= end of the period)	City II, First Sub-phase	*ca.* +6.45 m	*ca.* +10.55m	LBA II–LBA IIIA1	Serraglio: Zone I, room with burnt earth and charcoal fragments (August 14, 936); Serraglio: Zone II, *Vano* A, Court B, and *Vano* C (Summer 1941).
	City II, Second Sub-phase	*ca.* +7.10 m		LBA IIIA1	Serraglio: Zone II, V*ano* A, raised floor, second phase (Summer 1941).
LBA IIIA–LBA IIIB	City III, First Sub-phase	*ca.* +7.30 m	*ca.* +11m	LH IIIA2–LH IIIB1	Serraglio: Zone II, northwest corner, fill from underneath the House of the Figs floor (March 2, 1946).
LBA IIIB Final (= end of the period)	City III, Second Sub-phase	*ca.* +7.90 m		LH IIIB1–LH IIIB2 Late	Serraglio: Zone II, northwest corner, House of the Figs floor Level (February 28 to March 1, 1946).
LBA IIIC	City IV	*ca.* +8.60-8.90 m	*ca.* +11.40m	LH IIIC Phases 1-4****	Serraglio: Zone II, vessel possibly associated to the room cut by Tomb 14 (June 4, 1936); Serraglio: Zone I, occupational surface east of Tombs 1, 2, and 6 (June 18, 1936).

* The earliest phases are termed LBA I, II, and IIIA1 because during these periods Koan material culture was still typified by a strong local character. From LH IIIA2 onward, the typical Mycenaean sequence and terminology can also be applied to Kos (see Vitale 2007b, 44). ** For the complete list, see Morricone 1975; Vitale 2006; Vitale and Trecarichi 2015, 300, table 3. *** For the chronology and terminology of the LM IA period, see Van de Moortel 2001; Rutter and Van de Moortel 2006. **** For the chronology and terminology of the LH IIIC period, see Rutter 1977; 1978.

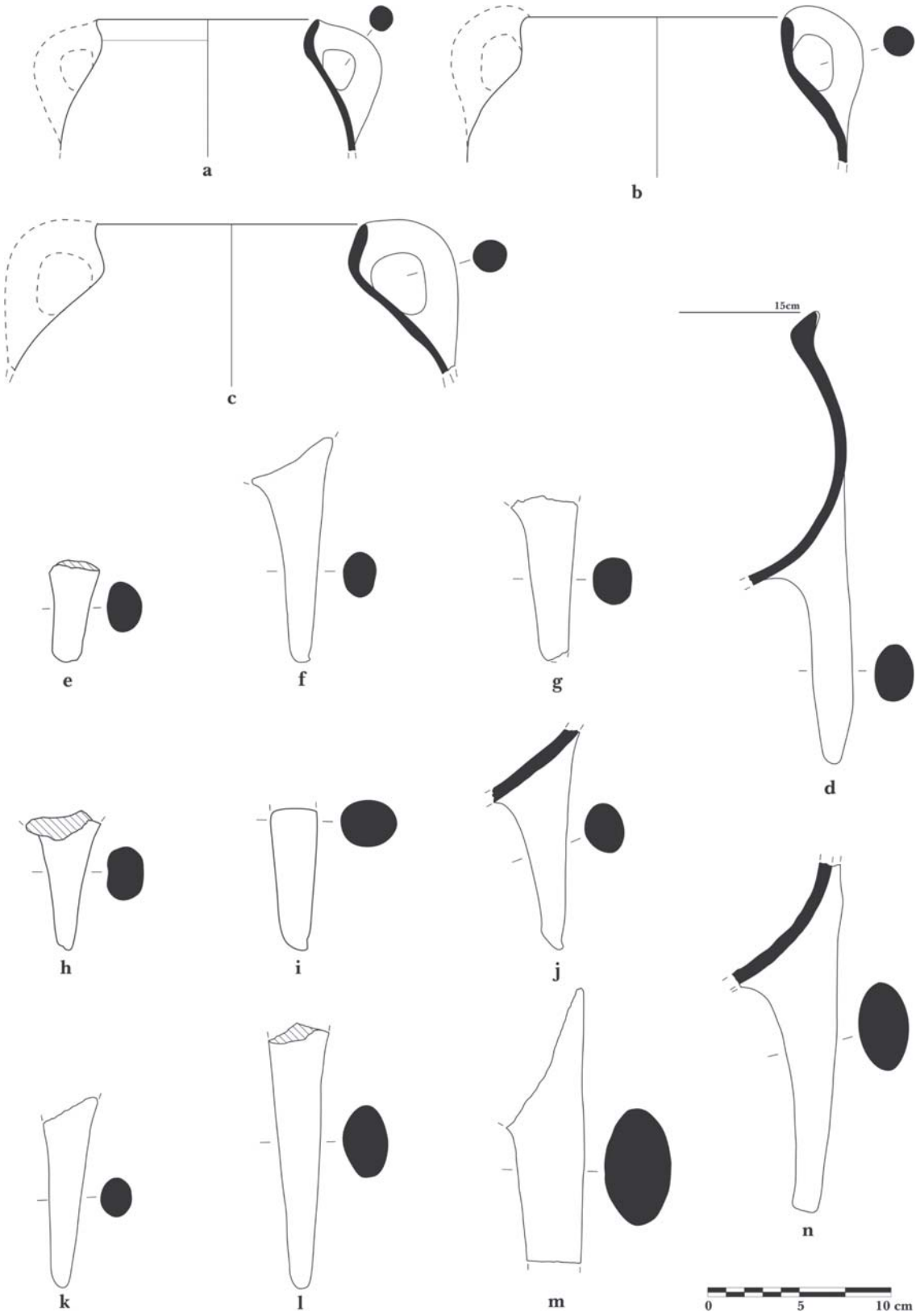


Figure 8.8. Cooking vessels from the "Serraglio": a–c. LH IIIA2–LH IIIC: MyUMC cooking jugs/amphoras FS 65/66; d–n. LH IIIA2–LH IIIC: MyUMC tripod cooking pots FS 320; a–b, d, f–i, k–l, m: M. Rossin and T. Ross; c, e, j, n: S. Regio and T. Ross

Table 8.4. Macroscopic inclusions and voids within SELAP fabrics groups

No.	*Color*	*Shape*	*Hardness*	*Size*	*Frequency and other features*	*Identification*
1	White to grey	Sub-round	Hard	<3 mm (occasionally 4 mm)	Very few to rare in coarse and very coarse fabrics; Possible conchodial fracturing	Possible quartzite
2	Brown to purple-red	Sub-round	Hard	<3 mm (occasionally 4 mm)	Very few to rare in coarse and very coarse fabrics; Possible conchodial fracturing	Possible chert
3	Grey to white (with fine-grain texture)	Sub-angular and sub-round	Hard	<3 mm (occasionally 3–4 mm)	Rare in coarse and very coarse fabrics	Possible limestone or quartzite
4	Shiny, black (possibly dark green)	Elongated, sub-angular to angular	Hard	1–3 mm	Common in coarse and very coarse fabrics	Possible accessory mineral, *e.g.* hornblende
5	Shiny, clear to opaque with striated or "fractured" texture	Sub-angular to angular	Hard	1–2 mm (occasionally 3 mm)	Common in coarse and very coarse fabrics; Independent or multi-clustered grains	Possible feldspar
6	White to grey with foliate texture	Somewhat elongated, sub-round	Soft	<2 mm (occasionally 4 mm)	Very few to rare in coarse and very coarse fabrics	Possible metamorphic rock, *e.g.* phyllite
7	Brown to purple with fine-grained texture	Sub-angular	Soft	1–2 mm (occasionally 5–6 mm)	Rare to very rare in coarse and very coarse fabrics	Possible low-grade metamorphic or sedimentary rocks
8	White to cream	Sub-round to round	Soft	1–3 mm (occasionally 4–6 mm)	Few to rare in coarse and very coarse fabrics	Possible calc bits that are naturally in the clay and cause spalling
9	Cream-to white/grey with striated and/or "pumiced" texture with darker specks within the matrix	Sub-round to round	Soft	1–2 mm (occasionally 3–4 mm)	Common to very few in coarse and very coarse fabrics	Possible tuff or pumice
10	Shiny orange-tan with fine grain texture	Flat, sub-round	Soft	<3 mm (occasionally 4–5 mm)	Rare in coarse and very coarse fabrics	Possible low-grade metamorphic rock, *e.g.* phyllite and mudstone
11	Purple to red	Sub-round	Soft	<2 mm (occasionally 3–4 mm)	Rare in coarse and very coarse fabrics	Possible low-grade metamorphic rock, *e.g.* mudstone
12	Orange to red	Round	Soft	1 mm	Very few in coarse and very coarse fabrics	Possible very soft sedimentary inclusion or "clay stone"
13	Black to brown	Sub-round to round	Soft	<2 mm (occasionally 3–4 mm)	Very few to rare in coarse and very coarse fabrics	Possible very soft sedimentary inclusion or "clay stone"
14	Shiny, clear with faceted surface	Angular	Too small for hardness test but possibly hard	1–2 mm	Few to rare in coarse and very coarse fabrics	Possible quartz and/or feldspar
15	Gold ("gold mica" flakes)	Sub-round to round	Too small for hardness test	<1 mm (occasionally 2 m)	Few to rare in coarse and very coarse fabrics	Possible biotite

Voids

No.	*Shape*	*Size*	*Frequency and Other Features*	*Identification*
1	Sub-round to round	2–4 mm (occasionally 6–8 mm)	Variable between fabric groups	Possibly due to calc or other soft inclusions that eroded out of the paste
2	Elongated	2–4 mm (occasionally 6–8 mm)	Variable between fabric groups	Possibly from grass/chaff tempering
3	Round	1–2 mm	Variable between fabric groups, but often leaves a porous texture	Possibly from the end of grass/chaff or inclusions that have dissolved or fallen out of paste (especially on the surface)

Table 8.5. Koan macroscopic fabric sub-groups of locally made storage, cooking, and utilitarian vessels

Macroscopic fabric sub-groups	*Texture*	*Paste*				*Summary (sand type, non-plastic inclusions, and voids)*
		Density of inclusions	*Sand size*	*Type*	*Hardness*	
B-III	Poor	Medium	Coarse to very coarse	Non-micaceous*	Medium	<2mm Meta-ign sand, 2–6mm chaff voids
B-V	Poor	Medium	Coarse to very coarse	Non-micaceous	Hard	<2mm possible Meta-ign sand; white/cream soft inclusions (possible calc or sedimentary material) can be present, but not in large quantities
B-VI	Poor	Medium	Coarse to very coarse	Non-micaceous	Hard	<2mm Meta-ign sand; white/cream soft inclusions (possible calc or sedimentary material)
B-VII	Poor	Medium-coarse to coarse	Coarse to very coarse	Non-micaceous	Hard	<3mm Meta-ign sand; "gold" or "silver mica" can be present, but not in large quantities; white/cream soft inclusions (possible calc or sedimentary material) can be present, but not in large quantities
B-IX	Well to moderate	Medium-coarse to coarse	Coarse to very coarse	Non-micaceous	Hard	<3mm Meta-ign sand; "gold" or "silver mica"; white/cream soft inclusions (possible calc or sedimentary material); <2mm clear shiny inclusions (possible quartz or feldspar); <1mm black shiny inclusions (possible hornblende)
B-XI	Poor	Medium-coarse to coarse	Coarse to very coarse	Non-micaceous	Hard	<3mm Meta-ign sand; <3–4mm white/cream soft inclusions (possible calc or sedimentary material); "gold mica"
C-II	Poor	Very coarse	Very coarse to pebble	Non-micaceous	Hard	<5mm Meta-ign sand, 2–6mm chaff voids
C-III	Poor	Very coarse	Coarse to very coarse	Non-micaceous	Hard	<2mm possible Meta-ign sand; <2mm mix of white/grey "pumice"; 2–6mm chaff voids
C-IV	Moderate	Coarse	Coarse to very coarse	Non-micaceous	Hard	<2mm Meta-ign sand; "gold" or "silver mica"; <2mm shiny clear inclusions (possible quartz or feldspar); <1mm black shiny inclusions (possible hornblende); 2–6mm chaff voids

Abbreviations and key: Meta-ign sand = metamorphic-igneous sand; Density of inclusions: Medium = 7–10%, Medium-coarse = 15–20%, Coarse = 25–30%, Very coarse = 40–50% (Moody et al. 2003; Munsell 2009, 9–10); Sand size: Coarse = 0.5–1mm, Very coarse = 1–2mm, Pebble = 4–64mm; * In order to be considered micaceous, a paste must include abundant mica, which causes the paste to have a "shiny" appearance throughout the fabric. Therefore, mica can be present in relatively small quantities within what can be labeled as a non-micaceous paste.

Vessels assignable to Sub-Groups B-III, C-II, C-III, and C-IV (Tables 8.2, 8.5; Fig. 8.9) date to the EBA 1–2 phases, while vessels attributed to Sub-Groups B-V, B-VI, B-VII, B-IX, and BXI date to the LBA (Tables 8.2, 8.5; Fig. 8.10). In addition to chronology, the defining features of these sub-groups are illustrated in Table 8.5, including texture, paste, and summary of sand type, non-plastic inclusions, and voids.

The main distinguishing elements among the nine sub-groups are the presence or absence of chaff temper and the density of inclusions in the paste. The sub-groups dating to the EBA 1–2 period have chaff voids and tend to have a higher density of inclusions within the paste that creates a coarser fabric. On the other hand, the sub-groups dating to the LBA do not have chaff voids and are comparatively less coarse.[11] (JEM)

LBA fabrics and their relationship to shapes and potting traditions

During the LBA, Koan locally produced storage, cooking, and utilitarian vases included a diverse range of shapes that originated from different potting traditions. Local Tradition cooking and cooking-related

utilitarian vessels included jars, a conical lid, a biconical jug, and a biconical spouted tripod (Table 8.2, nos 23–25, 28, 33–34, 36; Figs 8.5a–c, f, 8.7a–b, d). In terms of fabric, they can be assigned to Sub-Groups B-VI, B-VII, and B-IX (Table 8.6; Fig. 8.10). Minoan and Mycenaean-type cooking and cooking-related utilitarian pots included cooking jugs, amphoras, tripods, and braziers (Table 8.2, nos 26–27, 29–31, 37–52; Figs 8.5d–e, g–i, 8.7e–f, 8.8). All of the available specimens belonged to Sub-Groups B-VI, B-VII, B-IX, and B-XI (Table 8.6; Fig. 8.10).

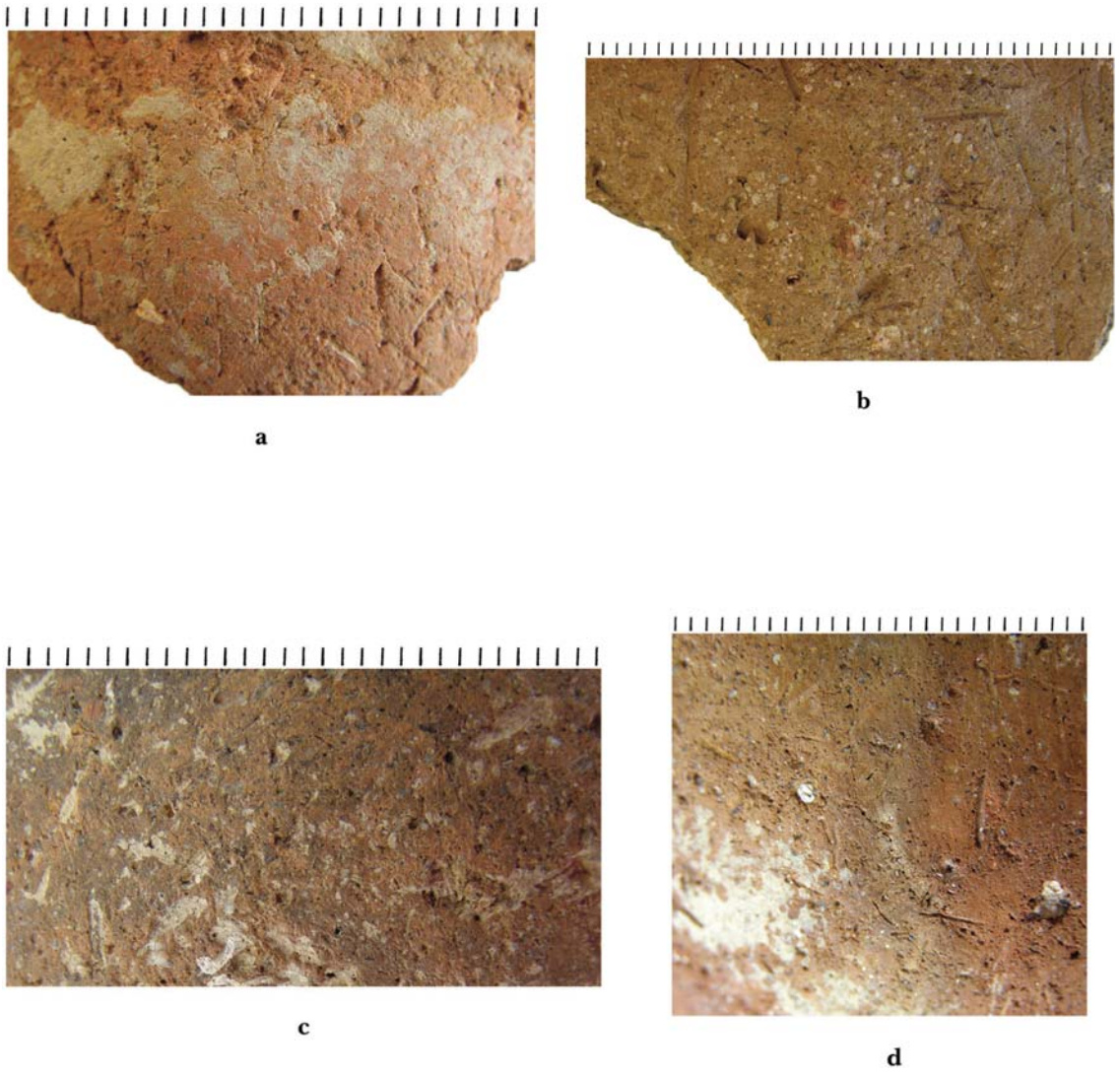


Figure 8.9. EBA 1–2 macroscopic fabric sub-groups from the Asklupis: a. Sub-Group B-III; b. Sub-Group CII; c. Sub-Group C-III; d. Sub-Group C-IV; a–d: J. E. Morrison; each dash in the scale corresponds to 1mm

LBA storage vessels appear in a variety of pithoi and pithoid jars. Typologically, they all conform to Local Tradition standards. However, during LBA IA and LBA IB, some of them can be assigned to the Entangled MC-C LoD/DoL classes, based on their decorative treatment (Table 8.2, nos 17–22, 32, 35; Figs 8.4, 8.6a, 8.7c). In terms of fabric, Koan LBA storage vessels fall within Sub-Groups B-V, B-IX, and B-XI (Table 8.6; Fig 8.10).

Despite the variety of pottery traditions and shapes, this brief overview shows that all Koan LBA storage, cooking, and cooking related utilitarian vessels were manufactured using a common and relatively small array of local fabric mixes. (JEM)

Manufacturing techniques

The identification of Koan manufacturing techniques was accomplished following a similar protocol to that described recently by M. Choleva (2012, 351–358, with bibliography). Accordingly, the terminology employed within this section broadly conforms to that used recently by the Greek scholar.

During the EBA 1–2, the Koan ceramic assemblage was as a rule fully handmade, with very few possible exceptions (Table 8.2, nos 1–16; Vitale 2013, 54, table 3). At least one pithos fragment from the Asklupis area shows evidence for the use of coil building techniques (Table 8.2, no. 02; Fig. 8.3b). Other potential candidates for the use of this method occur, but the identification is uncertain because of the heavy degree of wear of the Asklupis fragments. No judgment can be made on cooking pots, since these vessels are preserved exclusively in the form of tripod legs.

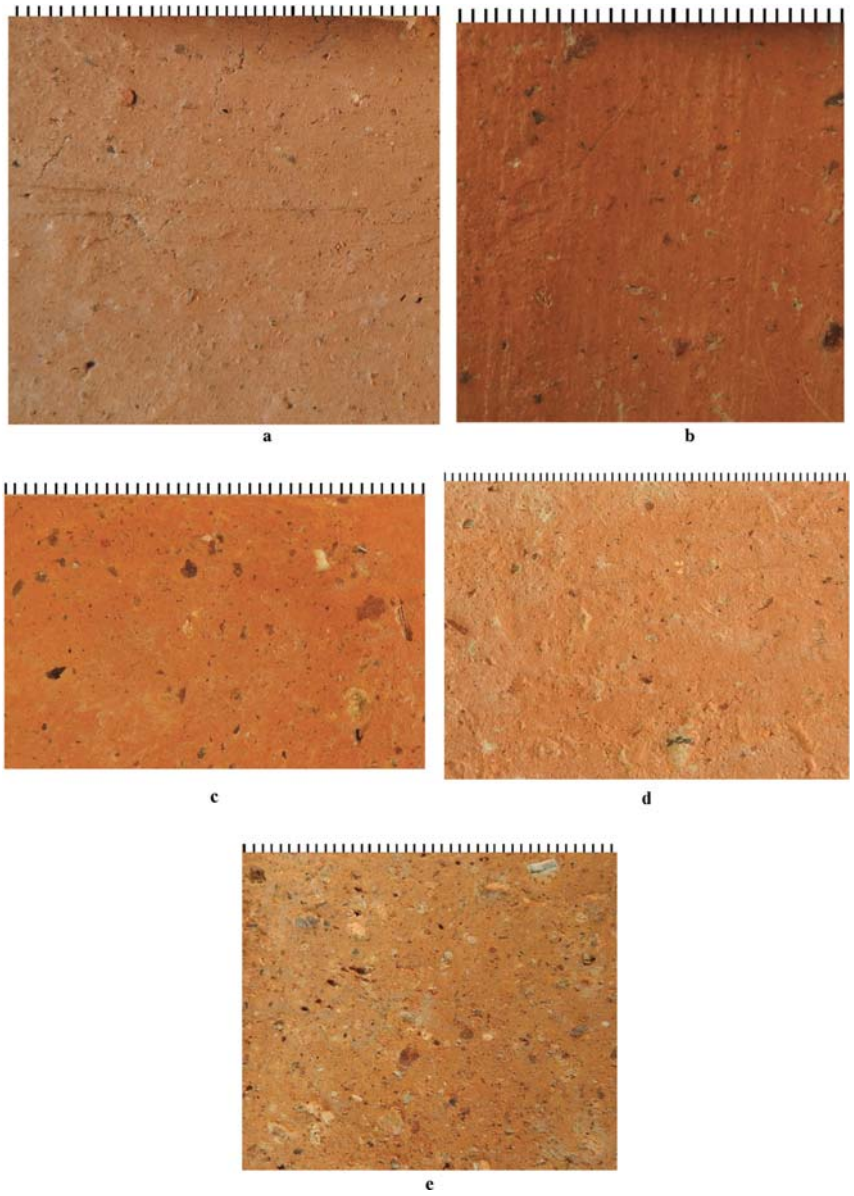


Figure 8.10. LBA macroscopic fabric Sub-Groups from the "Serraglio": a. Sub-Group B-V; b. Sub-Group B-VI; c. Sub-Group B-VII; d Sub-Group B-IX; e. Sub-Group B-XI; a–e: S. Vitale; each dash in the scale corresponds to 1mm

Between EBA 3 and the end of the MBA, wheel technology is definitely attested on Kos for a variety of

shapes, including coil-built and wheel-fashioned bowls, carinated cups, and semi-globular cups (Marketou 1990b; 2004, 25–27). It is likely that some form of wheel technology was also used to produce storage and cooking pottery during these phases, but this cannot be proved based on the evidence published thus far.[12]

Between LBA IA Early and LBA IB, four features are particularly worthy of note. First, some of the UPC and the LoD/DoL pithoi were still fully handmade (Table 8.2, nos 17, 20; Fig. 8.11a–b). Second, most of the Koan vases were coil-built and wheel-fashioned, regardless of the potting tradition to which they belonged (Table 8.2, nos 21–23, 25–26, 30–31; Fig. 8.11c–d). Third, the irregular thickness of the walls may indicate that local potters were using either a slower wheel than their Minoan and Mycenaean contemporaries or a different wheel technique. Finally, storage and cooking vessels assignable to the Local and the Entangled traditions show the combination of two different techniques in the same specimen, with some parts of the body being handmade and others being coil-built and wheel-fashioned (Table 8.2, nos 18–19, 24, 32; Fig. 8.12a–b).

Some technological changes can be observed during the phases from LH IIIA2 to LH IIIC. This is indicated by the occurrence of more regular and symmetrical body profiles, showing a consistent thickness of the walls (Table 8.2, nos 35–36, 38, 39–42; Figs 8.7c–d, f, 8.8a–d), and by the occurrence of wheel-thrown cooking pots (Table 8.2, nos 40, 42; Fig. 8.12c) in addition to coil-built and wheel-fashioned cooking pots (Table 8.2, nos 35–36, 38–39, 41, 48, 52; Fig. 8.12d). These novelties in the manufacture of Koan storage and cooking vessels may suggest the introduction of a different wheel technique than that characteristic of the Local Tradition in the previous phases. It is likely that these developments are due to the spread of the Mycenaean culture on the island and, more generally, within the east Aegean-west coastal Anatolian region.

The position of the LBA II–LBA IIIA1 phases in the technological trajectories described above cannot be precisely established because of the scantiness of the available evidence, basically limited to two complete vases (Table 8.2, nos 33–34; Fig. 8.7a–b). These specimens can be attributed to the Local Tradition, although they also show Mycenaean features. This statement, previously established on typological grounds, may apply to the manufacturing process as well. In fact, the MD jug and the UPMC tripod from *Vano* C and Court B are both coil-built and wheel-fashioned according to Local Tradition techniques, but they exhibit relatively regular walls and symmetrical profiles. (SV and JEM)

Discussion of the evidence

Throughout the Bronze Age, storage, cooking, and cooking related utilitarian vessels on Kos followed two similar but distinct trajectories. Storage pottery remained attached to the Local Tradition repertoire, showing important indicators of continuity throughout the phases considered (Tables 8.2, 8.6). The vast majority of the EBA and LBA specimens belong to the UPMC and UPC classes, share significant typological features, and were produced using similar fabric mixes, with the presence or absence of chaff tempers representing the result of local technological developments through time, rather than the outcome of off-island influence. In terms of manufacture, there is an obvious change between the fully handmade methods of the EBA 1–2 phases and the coil-built and wheel-fashioned or combined handmade and coil-built and wheel-fashioned methods of the LBA. However, this difference again reflects local technological choices rather than off-island influences, as coil-built and wheel-fashioned specimens occur on Kos as early as the EBA 3. In fact, coil-built pithoi may have appeared on Kos since the EBA 1–2 phases and may represent a link between EBA and LBA storage vessel construction techniques.

Some pithoid jars were also manufactured in the Entangled MC-C LoD/DoL classes during LBA IA and LBA IB. Despite the occurrence of Minoan-type decorative elements, however, all of the Entangled storage vessels were fully embedded in the Koan Local Tradition in terms of fabric mixes, manufacturing technique, typological features, and functional characteristics.

Cooking and cooking related vessels also show significant elements of continuity throughout the Bronze Age. However, the interplay between different traditions produced a more diverse development. In this respect, three distinct periods can be identified: EBA 1–2, LBA IA, and LH IIIA2 to LH IIIC. The EBA 1–2 phases are dominated by the Local Tradition repertoire (Table 8.2). All specimens belong to the UPMC and UPC classes, are typologically part of the east Aegean-west coastal Anatolian regional koine, and are manufactured according to local fabric mixes with materials situated in the close vicinity of the Asklupis.

During LBA IA, specifically in the Mature sub-phase, MiUMC cooking and cooking related vessels were documented for the first time at the "Serraglio" alongside UPMC and UPC Local Tradition specimens (Tables 8.2, 8.6). Unfortunately, because of the limitations of the available evidence, it is not possible to establish the respective percentages of these two components of the Koan ceramic assemblage. However, the coexistence of these two different traditions is by itself significant.

The appearance of Minoan Tradition cooking pots during LBA IA is accompanied by the presence of other Cretan style features in the architectural, ceramic, and weaving equipment repertoires. These elements may reflect the wish of the Koan elites to take part in Minoan-type social practices during the period of the most dynamic economic, cultural, and political expansion of the Cretan palaces (Vitale 2016a; Vitale and Hancock Vitale 2010, 68–74; 2013, 55). Minoan influence, however, was not significant in terms of fabric mixes and ceramic technology. In fact, Local and Minoan Tradition cooking pots were all produced on Kos, following Local Tradition mixes and a non-Cretan type of wheel technology (Tables 8.2, 8.6).

Significant changes may have occurred at the "Serraglio" during the phases from LH IIIA2 to LH IIIC. Within this period, MyUMC cooking pottery seems to have become predominant on Kos. This fact is suggested by the materials recovered from the fills underneath and above the House of the Figs, as well by the stray ceramic fragments recovered in the area of the settlement. The MyUMC repertoire included cooking jugs/amphoras FS 65/66 and tripods FS 320, while Local Tradition specimens were represented by UPMC and MD jars.

The shift toward Mycenaean cooking pot types did not have a significant impact on the range of fabric mixes used by Koan potters in the second half of the LBA, as most of the Local Tradition and MyUMC cooking vessels dating to this period fall within Sub-Groups B-VI, B-VII, and B-IX, as did the majority of the LBA specimens recovered by Morricone, regardless of their potting tradition (Tables 8.2, 8.6). This fact represents a strong element of continuity within Koan potting practices, implying the consistent exploitation of similar clay sources, not only during the LBA, but possibly the entire Bronze Age, if one considers the elements in common among Sub-Groups B-VI, B-VII, and B-IX and their EBA predecessors B-III, C-II, C-III, and C-IV. On the other hand, the possible introduction of a different wheel technology between LH IIIA2 and LH IIIC suggests that Mycenaean-type manufacturing methods may have had a significant impact on this crucial aspect of the production process (Table 8.2).

The data concerning the remaining phases surveyed within this paper are at best scanty. No Koan EBA 3 and MBA cooking pots have been published thus far. The only information on food processing practices during LBA IB come from stone tools. The peperino oval slab and the marble deep bowl from the "Serraglio" (Fig. 8.6b–c) show that local and possibly imported grinding devices were used simultaneously on Kos during this phase. Finally, the cooking jug and the tripod cooking pot nos. 33–34 (Fig. 8.7a–b) suggest that during LBA II–LBA IIIA1, Mycenaean elements were introduced within the Local Tradition repertoire.

Concluding our discussion, an interesting typological distinction between the various potting traditions used on Kos during the LBA should be noted. While the local assemblage consisted mostly of jars, Minoan and Mycenaean types included a significant presence of tripods (Table 8.6). This shape, which occurred on the island during the EBA 2 (Fig. 8.3d–h), may have disappeared after this phase (Georgiadis 2012, 59–60) and is not represented in the LBA IA Local Tradition repertoire. The coexistence during the LBA of jar-based and tripod-based cooking sets suggests the simultaneous use of different cooking techniques connected to the

Local Tradition on one side and to Cretan and Greek Mainland traditions on the other. (SV and JEM)

Final statements

The evidence above indicates an important continuity in food storage practices, which, throughout the analyzed phases, were largely embedded in the Koan Local Tradition. The Local Tradition also played an enduring role in food preparation activities during the EBA and the LBA, as suggested by the widespread occurrence of UPMC and UPC cooking vessels within both phases. However, from the beginning of the LBA, the appearance of Minoan and Mycenaean types implies the coexistence on Kos of a range of culturally diverse food preparation practices.

A major result of Minoan and Mycenaean influence was the re-introduction of the tripod cooking pot. Besides a shift in cooking technology, the appearance of this type may imply also the appearance of Cretan and Greek Mainland culinary novelties on Kos during the LBA, although this hypothesis remains speculative in the absence of microbotanical residue analysis.[13] The character of Minoan and Mycenaean influence on Koan cooking pottery, however, was different in terms of duration, quality, and quantity. Minoanization was a relatively brief phenomenon that did not cause a drastic or definitive change to the local assemblage and had no obvious impact on ceramic fabrics and technology. By contrast, Mycenaeanization was a longer process that resulted in greater changes to the cooking pottery typological repertoire, as well as to the pottery manufacturing process.

The different impact of Minoan and Mycenaean influence on Koan cooking pottery reflects the wider behavior of Minoanization and Mycenaeanization on the island. The former process was characterized by a stronger degree of cultural entanglement and ideological exchange with established local traditions but did not radically change the character of Koan material culture. The latter was more pervasive, included more significant cultural markers, and eventually resulted in the formation of a Mycenaean cultural identity on Kos (Vitale 2016a; Vitale and Trecarichi 2015, 331). (SV and JEM)

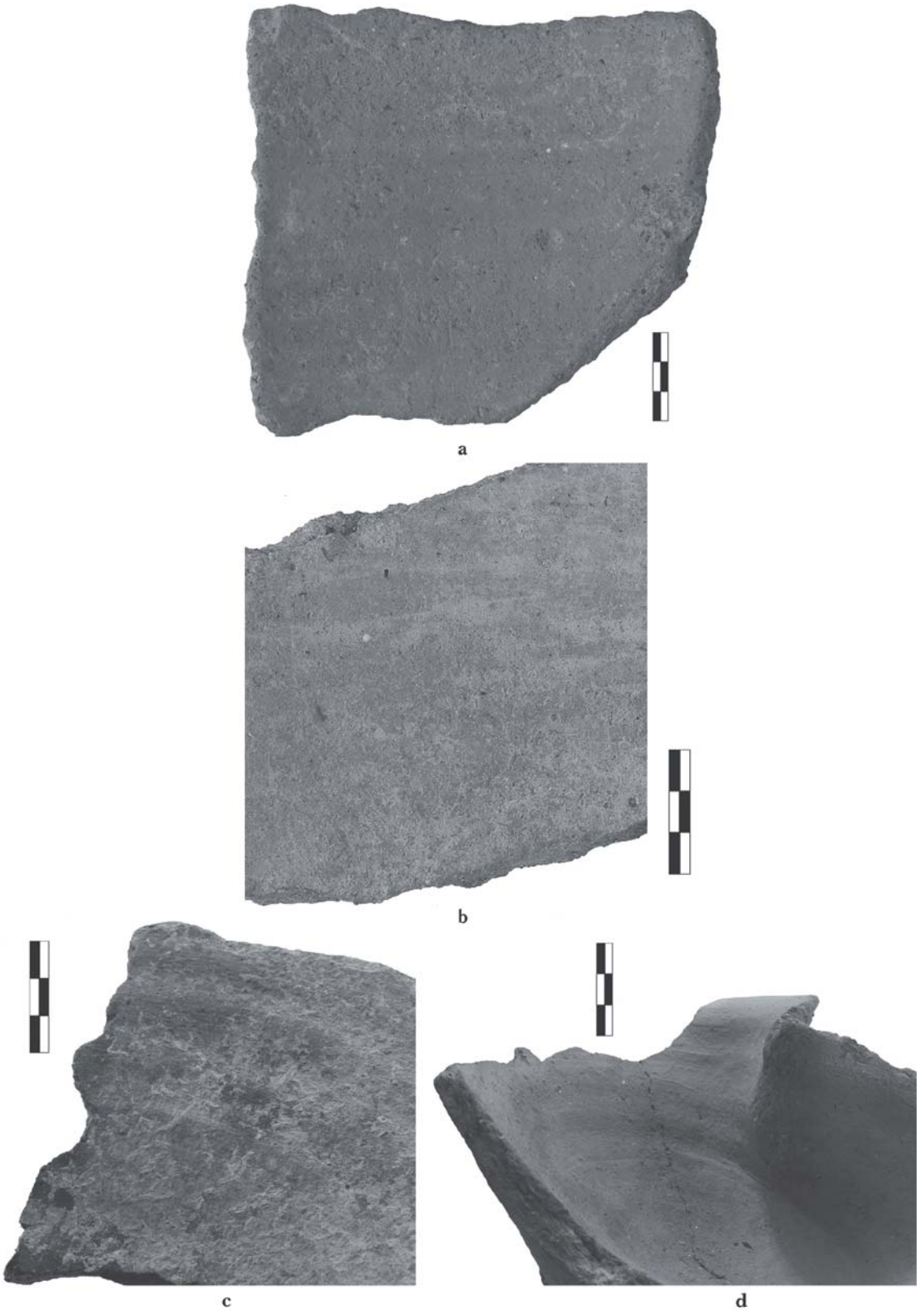


Figure 8.11. LBA pots from the "Serraglio": a. LBA IA Early: fully handmade C LoD pithoid jar (Table 8.2, no. 20); b. LBA IA Early–Mature: fully handmade UPC pithos (Table 8.2, no. 17); c. LBA IA Early–Mature: coil-built and wheel-fashioned UPMC cooking lid (Table 8.2, no. 25); d. LBA IA Mature: coil-built and wheel-fashioned MiUMC brazier (Table 8.2, no. 31); a–d: S. Vitale

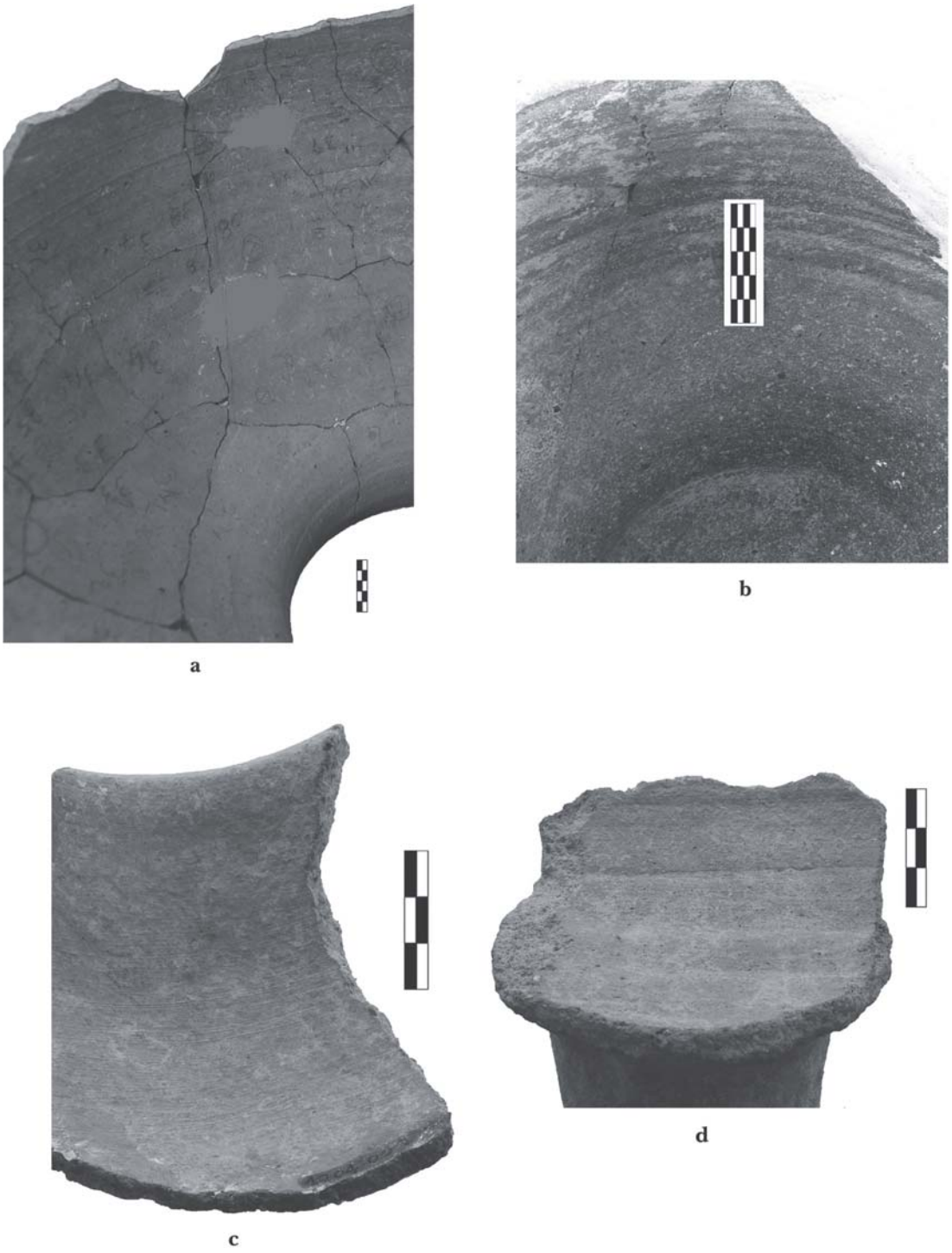


Figure 8.12. LBA pots from the "Serraglio": a. LBA IA Early–Mature: MC LoD DB pithoid jar showing the combination of fully handmade with coil-built and wheel-fashioned techniques (Table 8.2, no. 18); b. LBA IA Early–Mature: UPC cooking jar showing the combination of fully handmade with coil-built and wheel-fashioned techniques (Table 8.2, no. 24); c. LH IIIA2–LH IIIC: wheel-thrown MyUMC tripod cooking pot FS 320 (Table 8.2, no. 42); d. LH IIIA2–LH IIIC: coil-built and wheel-fashioned MyUMC tripod cooking pot FS 320 (Table 8.2, no. 52); a: J. E. Morrison; b–d: S. Vitale

Table 8.6. Correlation between LBA shapes, fabrics, and potting traditions in the examined Koan sample

Shapes	*Local tradition*					*Sub-totals*
	B-V	*B-VI*	*B-VII*	*B-IX*	*B-XI*	
Pithoi	0	0	0	3	0	3
Cooking jars	0	0	1	2	0	3
Cooking pot lid	0	0	0	1	0	1
Cooking jug (with Mycenaean traits)	0	0	0	1	0	1
Cooking tripod (with Mycenaean traits)	0	1	0	0	0	1
Jar (utilitarian, related to cooking)	0	0	0	1	0	1
Sub-totals	0	1	1	8	0	10
	Entangled tradition					*Sub-totals*
	B-V	*B-VI*	*B-VII*	*B-IX*	*B-XI*	
Pithoid jars	3	0	0	1	1	5
Sub-totals	3	0	0	1	1	5
	Minoan tradition					*Sub-totals*
	B-V	*B-VI*	*B-VII*	*B-IX*	*B-XI*	
Tripod cooking pot	0	0	0	2	0	2
Braziers (utilitarian, related to cooking)	0	0	1	2	0	3
Sub-totals	0	0	1	4	0	5
	Mycenaean tradition					*Sub-totals*
	B-V	*B-VI*	*B-VII*	*B-IX*	*B-XI*	
Cooking jug/amphora FS 65/66	0	0	1	3	0	4
Tripod cooking pot FS 320	0	1	1	9	1	12
Sub-totals	0	1	2	12	1	16
Fabric group totals	**3**	**2**	**4**	**25**	**2**	**36**

Notes

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3 For SELAP publications, see Vitale 2012a; 2012c; 2013; 2016a; 2016b; in press; Vitale and Hancock Vitale 2010; 2013; Vitale and Trecarichi 2015.

4 For a similar approach, see Rutter 1995, 13–14 (with bibliography).

5 As to grain size, Koan ceramics are classified as fine when the largest inclusions do not exceed 2mm, medium-coarse when the largest inclusions are between 2mm and 4mm, and coarse when the largest inclusions exceed 4mm (Rutter 1995, 54, with bibliography).

6 For the expressions "entangled objects" and "cultural entanglement," see Thomas 1991; Dietler 1998; Hodder 2011a; 2011b; Stockhammer 2012a, 43; 2012b, 89–90.

7 Within the LH IIIA2 to LH IIIB1 fill, there were 42 UPMC storage specimens (97.7%) and one MD specimen (2.3%). Within the LH IIIC materials from the fill above the floor of the House of the Figs, there were six UPMC storage specimens (85.7%) and one MB specimen (14.3%).

8 In terms of density of non-plastic inclusions to the paste, Group A fabrics range from "fine" to "fine-medium", Group B fabrics from "medium" to "medium-coarse to coarse", while fabrics of Groups C and D both include "coarse" to "very coarse" mixes.

9 The complete list of SELAP's macroscopic fabric groups is as follows: A-I, A-II, A-III, A-IV, A-V, A-VI, A-VII, A-VIII, B-I, B-II, B-III, B-IV, B-V, B-VI, B-VII, B-VIII, B-IX, B-X, B-XI, C-I, C-II, C-III, C-IV, D-I, D-II, D-III.

10 Preliminary analysis of raw clays and rock tempers was accomplished by Iliopoulos, Passa, and the author of this section at the laboratory of the Department of Geology of the University of Patras in the wider context of SELAP's petrographic study of Koan ceramics.

11 Outside of the functional categories considered in this paper, the use of chaff tempers still occurs on Kos during the LBA, but is much less common than in the EBA. The only two LBA fabric Sub-Groups with evidence for chaff tempers are B-IV and B-VIII.

12 Outside of Kos, no mention has been made of the manufacturing techniques employed for the construction of storage and cooking vessels from other sites in the wider east Aegean-west coastal Anatolian area (Benzi 1997; Raymond 2007; 2009).

13 A list of 25 samples for starch grain and phytolith analysis has been compiled by C. McNamee and the first author of this section during SELAP's 2014 and 2015 study seasons. The samples, which include ground stones and ceramics, will be processed and examined at the Malcolm H. Wiener Laboratory for Archaeological Science of the American School of Classical Studies at Athens by McNamee.

9

Late Minoan kitchens at Mochlos, Crete

Jerolyn E. Morrison

People prepare and consume food in many different circumstances, but domestic settings best illuminate the conditions of daily life. Such contexts can advance our understanding of Late Minoan (henceforth LM) society by showing how prehistoric people performed this task that is essential for sustaining life. Archaeologically, identifying and defining the domestic kitchen is far from simple, let alone comprehending the social structures underlying the material culture. This paper encourages ceramic specialists, in defining past cooking practices, to rethink how choices were made that have been materialized in the archaeological record.

Identifying suitable contexts has limitations because the quality and accessibility of information on these deposits impacts how archaeologists define and interpret cooking spaces and actions. One limitation is that the evidence examined suggests that in the LM period, individuals cooked in multiple areas within and outside houses in spaces with very few built hearths (Sackett *et al*. 1965; Shaw 1996; Betancourt 2001; Soles 2003, 24, 57, 65, 78, 109, 111, 2008; Brogan and Barnard 2011). Thus, it is challenging to recognize and clearly define cooking contexts. Furthermore, experimental cooking sessions demonstrate that multiple sessions must be undertaken before the physical evidence of cooking can be developed in a recognized form, *i.e*. burnt and ashy soil, concentrations of charcoal and burnt food remains. This finding suggests that cooking spaces, which were used for a longer period of time (*i.e*. areas with ten or more cooking sessions within a month) can be recovered by excavators more easily than those that were used less often or more sporadically (Morrison *et al*. 2015). A second limitation is finding appropriate ethnographic analogies for cooking practices, because there is often a lack of detailed information about how individuals handle various types of ceramic cooking pots for hearth cooking. Additionally, contextualization of the experimental and archaeological findings has been limited by the fact that very little is known about domestic life in the Minoan world. Unlike the historical periods in Greece, where texts partly illustrate the specific operational actions of the social aspects of domestic cooking, research has yielded no such texts so far. Iconography is equally unhelpful. To address these limitations, Mochlos LM cooking spaces are examined within the broader

context of their respective chronological periods to better understand the relationships among pots, cooking activities and other physical remains of domestic life.

On the northeastern coast of Crete, extensive excavations and publications have been carried out at Mochlos intermittently for over a century (Fig. 9.1; Seager 1912; Soles and Davaras 1992, 1994; 1996). Material from all phases of the Bronze Age as well as the Hellenistic and Early Byzantine periods have been uncovered on an island that was once connected to the Cretan Mainland by a narrow isthmus, which was submerged due to earthquakes (Soles 2003, 1). On the adjacent fertile coastal plain surrounded by the Ornos Mountains are LM IB Artisans' Quarters and a farmstead (Soles 2003, 1–3, 7, 103; 2008, 1–4, 129–184). Published food preparation and eating areas dating to these periods (Soles 2003; 2008) are reconstructed to illustrate where there may be connections with external cultures and if culinary practices are continuous (Fig. 9.2). The beginning of the Neopalatial period in the Aegean was a time that witnessed many changes. Initially, island and mainland communities re-established maritime trade connections after the Theran LM IA eruption (Warburton 2009); two or three centuries later, Crete underwent a veritable systems collapse in late LM IB (Hallager 2010). The LM II–IIIB periods witnessed the introduction of a stronger Mycenaean presence (Rehak and Younger 1998; Day 2008), brining mainland traditions (*i.e*. burial practices, Linear B writing), products, and presumably social behaviors and institutions to Crete.

This paper is divided into three sections that explore Minoan and Mycenaean cooking practices and spaces at Mochlos. The first section provides an overview of how cooking activities and spaces are defined at Mochlos. By examining material culture in context, the second section presents a detailed approach to reconstructing cooking techniques, practices, and spaces to emphasize the discontinuity of occupation between the LM I destruction and LM II–III reoccupation that could have influenced cooking and eating practices at Mochlos. The third section is a concluding discussion that addresses chronological and regional differences in cooking techniques and practices based on the material culture.

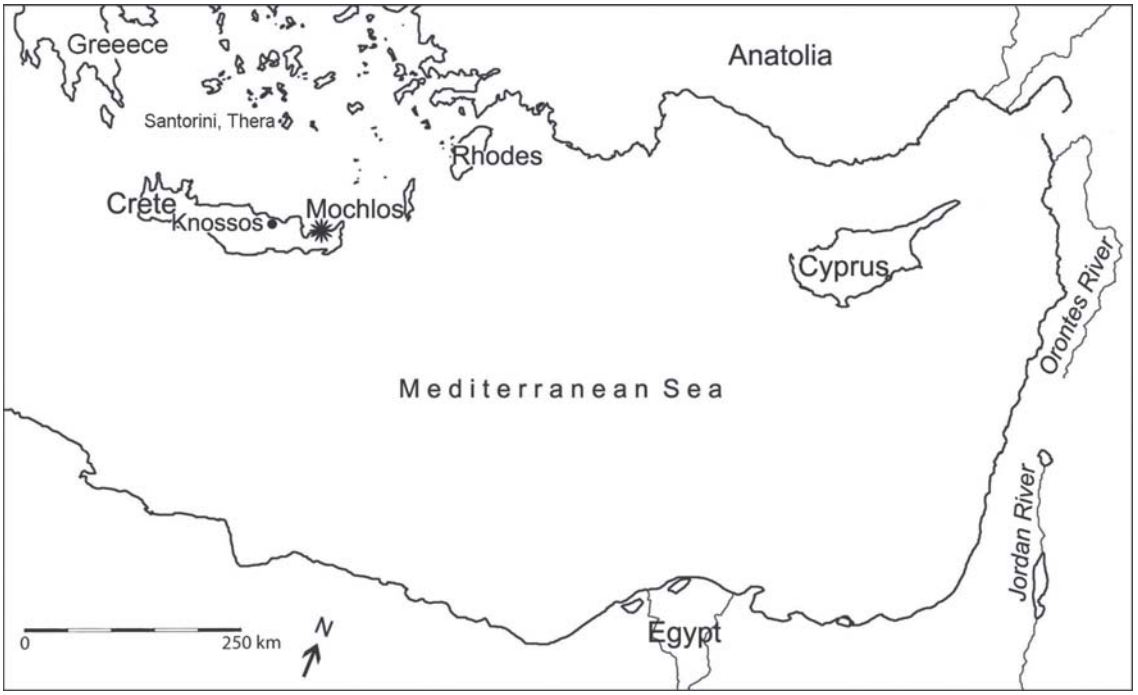

Figure 9.1. Map of the Eastern Mediterranean Sea with the island of Crete and the Late Minoan site of Mochlos

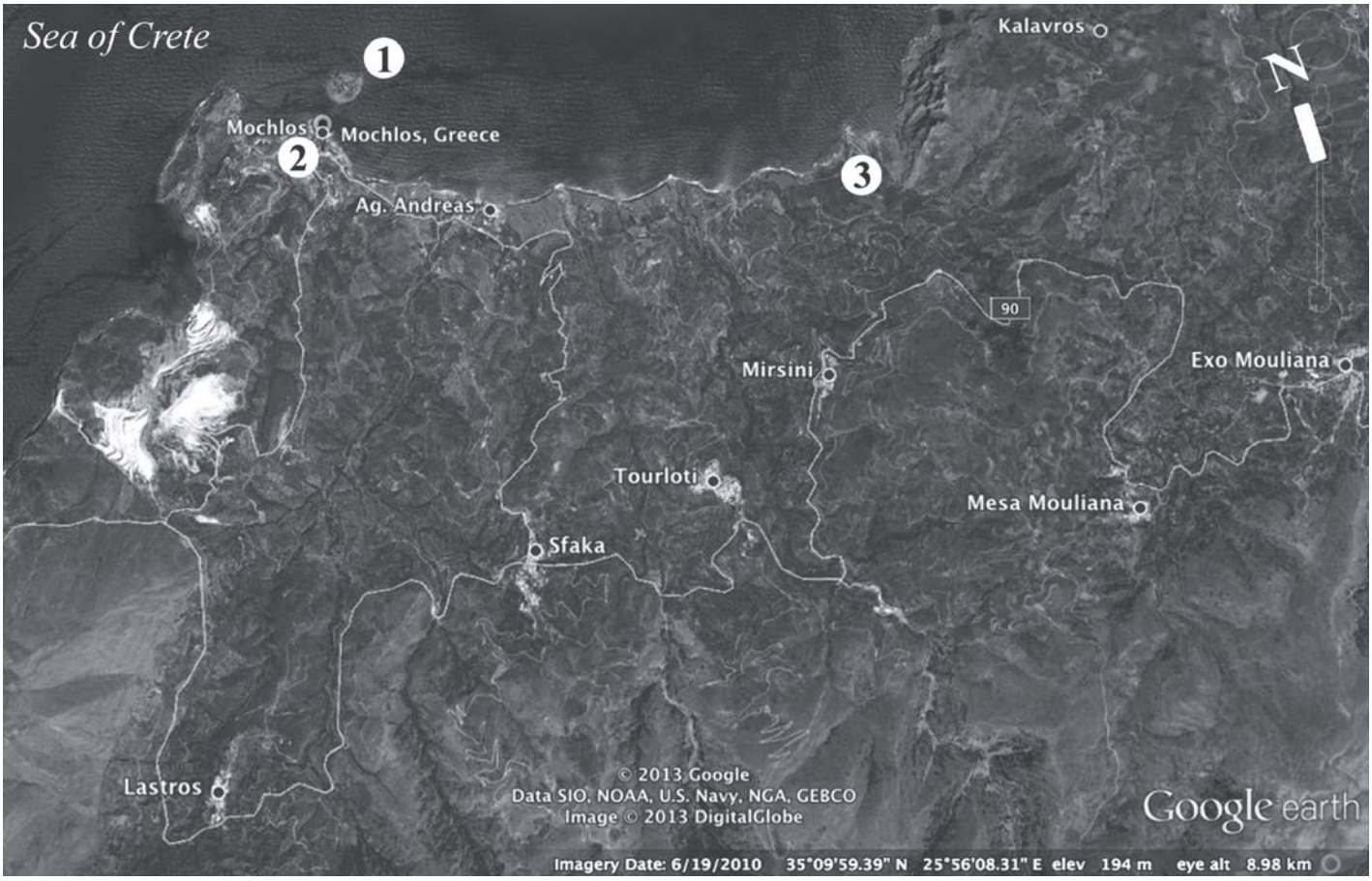

Figure 9.2. Mochlos Plain, Crete, Greece after Google Earth 2013. 1 = LMI and LM II–III settlements; 2 = LM 1B artisan's quarters; 3 = LM 1B Chalinomouri farmstead

Mochlos LM Settlements

A well-organized settlement, comprised of multiple structures reaching two or three stories high, was built on the island along paved roads in the Neopalatial period. On the opposite coast, the contemporary Artisans' Quarters, comprised of at least two multi-room, single-story buildings, was established. Based on a distinction between public workspace and private living quarters, the excavators propose that people both worked and resided in the compound (Soles 2003, 7–90). At the eastern end of the plain at Chalinomouri was an independent farming complex, a one-story structure with six rooms and attached porch (Soles 2003, 103–126). It is located next to the sea in a riverine ravine that gave its inhabitants access to fresh- as well as salt-water ecosystems. Based on the types and amounts of botanical and faunal remains recovered, the excavator proposes that its occupants practiced subsistence farming and produced surpluses of wine and olive oil. There is evidence of weaving, stone vase-making, and pottery production, but not on a large scale (Soles 2003, 103–104).

Reoccupation at Mochlos during the LM II–III period took place approximately 30–40 years after the destruction and abandonment of the Neopalatial town when the Mycenaean Greeks were believed to be in control of the palace at Knossos and were expanding their control into Eastern Crete (Soles 2008, 1–5). Mochlos would have been a strategic location at which to establish a satellite settlement because the new community could take advantage of the naturally protected harbor and agriculturally productive plain (Soles 2008, 5–128). Since the time between the destruction and abandonment of the LM IB settlement and the LM II–III reoccupation was brief, it was proposed by the excavators that some of the new settlers could have been direct descendants of families that had once lived at Mochlos (Soles 2008, 1–5). It is also possible that, if

there was a change in governmental structure, foreign people moved into the area bringing new ways of performing daily activities such as cooking. The LM II–III community could have been a mix of locals and foreigners, the latter including individuals possibly from the mainland or from other regions of Crete with access to mainland objects and traditions.

The LM II–III settlement is composed of 13 single-story, one- to three-room structures that were built amongst the ruins of the Neopalatial town. Six of the houses have a quadrangular plan with an axial arrangement of rooms, and several are distinguished by a separate cook shed located in an adjacent space (Soles 2008, 6–8). Cook sheds are enclosed or semi-enclosed spaces with abundant cooking and food processing equipment, such as cooking pots and stone tools, along with charcoal, food remains, as well as eating, drinking, and storage vessels. They are set apart from living quarters and typically restricted to domestic work associated with food. These architectural features may reflect mainland influence, or are at least a distinct LM III feature (Hayden 1987; Shaw 1990; Driessen and Farnoux 1993, 1994; Nixon 1996; Hallager 1997, 184, 185; Floyd 2000).

Domestic food preparation and cooking at Mochlos

LM IB and LM II–III floor surfaces yield information on food preparation and cooking activities that are identified by the presence of two or more of the following items: charcoal, food remains, cooking equipment, tools for grinding and cutting food, built hearths, and cooking holes. Eating and drinking activities are identified by the presence of cooking pots, cups, bowls, serving dishes, and food remains (Sackett *et al*. 1965; Shaw 1990, 1996; Betancourt 2001; Soles 2003; 2008; Brogan and Barnard 2011). In this section, foodstuffs, ceramic assemblages, and cooking deposits are examined to better define ancient cooking contexts at Mochlos.

Mochlos LM foodstuffs

Foodstuffs in the LM period broadly consist of supplies harvested from shallow coastal waters, from hunted and herded mammals, as well as cultivated and wild crops (Moody 2012, and the references therein). At Mochlos, individuals enjoyed a varied diet: in the LM IB period more seafood was consumed than meat, whereas the opposite was true in the LM II–III period (Reese *et al*. 2004; 2011). In both phases people herded or farmed sheep/goat (*Ovis/Capra*), pig (*Sus*), and cattle (*Bos*), and hunted or trapped wild hare (*Lepus*). In the LM IB period, individuals must have hunted or traded for deer, as antler and bone remains were found in the Chalinomouri farmhouse (Soles 2003, 107–110). This presence is unusual for this region: deer are typically associated with LM III deposits in West and North-Central Crete (Moody 2012).

Cereals and pulses mainly consisted of emmer (*Triticum dicoccum*), hulled barley (*Hordeum vulgare*), lentils (*Lens culinaris*), broad bean (*Vicia faba*), and dwarf chickling (*Lathyrus cicero* s.l.) (Reese *et al*. 2004; 2011). By modern standards, many of these can be ground into flour to make bread or thicken stews, and the legumes can be simmered to prepare soups (Rombauer and Becker 1995, 176). Tree and vine crops include olive (*Olea europaea*), fig (*Ficus carica*), almond (*Prunus amygdalus*), strawberry tree (*Arbutis unedo*), carob (*Ceratonia siliqua*), and grapes (*Vitis vinifera*) (Reese *et al*. 2004; 2011). The fruits of all of these trees except the olive and carob can be eaten fresh. Olives and almonds are processed to produce oil (Foxhall 2007, 131–128; Rombauer and Becker 1995, 563); almonds can also be ground into flour (Rombauer and Becker 1995, 780), and carob is used to make sweetened flour and syrups (Rombauer and Becker 1995, 550). Grapes are also used to make syrups, vinegars, and wine (McGovern 2007, 1), and cereal grains can also be fermented into beer (McGovern 2009, 269). All of the trees and vines could also be used as hearth fuel. A number of wild seeds were identified, the most prevalent being those of legumes: bitter vetch (*Medicago*),

grass (*Horderum*) and campion or catchflay (*Silene*) (Reese *et al*. 2004; 2011). Listed in the excavation publication once from the Chalinomouri farmhouse (Soles 2003, 111), fenugreek (*Trigonella*) should be mentioned because it is an exotic herb with medicinal properties cultivated in the Near East (Zohary and Hopf 2000, 122).

Mochlos LM cooking pot suite and other domestic vessels

Fundamentally, the Mochlos cooking pot suite is part of a broader LM Cretan tradition that endures and is not much altered by external influences. Potters utilized local metamorphic clays to produce tripod cooking pots, dishes, trays, and other domestic wares (Barnard 2003; Day *et al*. 2003; Nodarou 2003; 2007; 2010). Experimental work with Minoan-style cooking pots demonstrates that the deep body of tripod cooking pots is well suited to slow cooking, such as liquid-based stews of all food types. The shallower forms of cooking dishes serve better to quickly sauté, grill, or roast food, prepare sauces, and bake flatbread (Fig. 9.3) (Morrison *et al*. 2015).

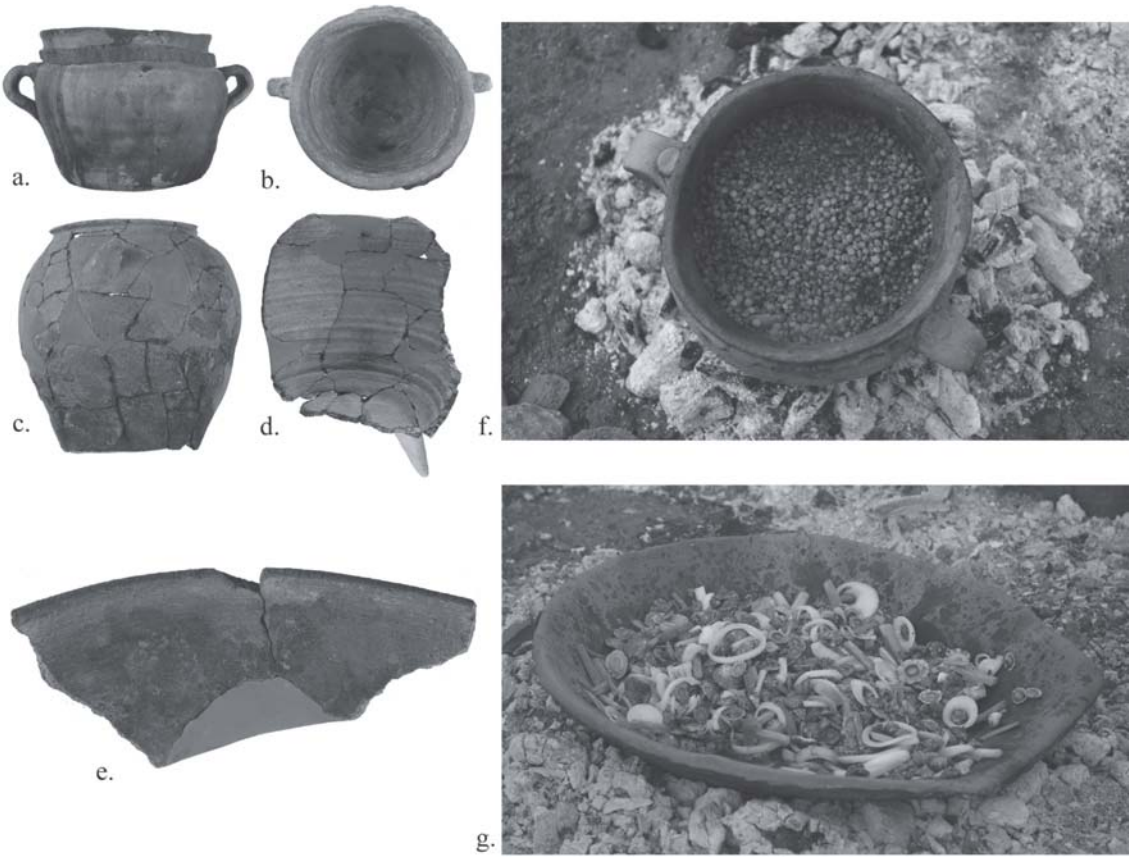

Figure 9.3. Experimental work that demonstrates how one can cook food in Late Minoan-style ceramic pots using various techniques and a hearth-fire: a. experimental cooking jar; b. experimental tripod cooking pot; c. Late Minoan cooking jar; burnt food on interior surface; d. Late Minoan tripod cooking pot; e. experimental cooking dish; f. boiling and stewing lentils in tripod cooking pots and jars; g. sautéing and simmering shellfish, limpets, and onions in a cooking dish. Identified carbon marks and burnt food by comparing the surfaces of experimental and Late Minoan pots: burning on exterior surface due to hearth-fire. Photographs by C. Papanikolopoulos, S. Johnson

Tripod cooking pots are the most prevalent, or at least the most easily identified, vessels used for cooking (Fig. 9.4). They are typically globular with everted rims, short necks, and flat bases with either

round-horizontal or oval-vertical handles set on the shoulder (Barnard *et al*. 2003; Smith 2010, 114–115). There are exceptions, but the morphologies are broadly consistent throughout the LM period, save that the LM II–III vessels are larger and occasionally their legs are marked with a large finger impression (Smith 2010, 114–115).

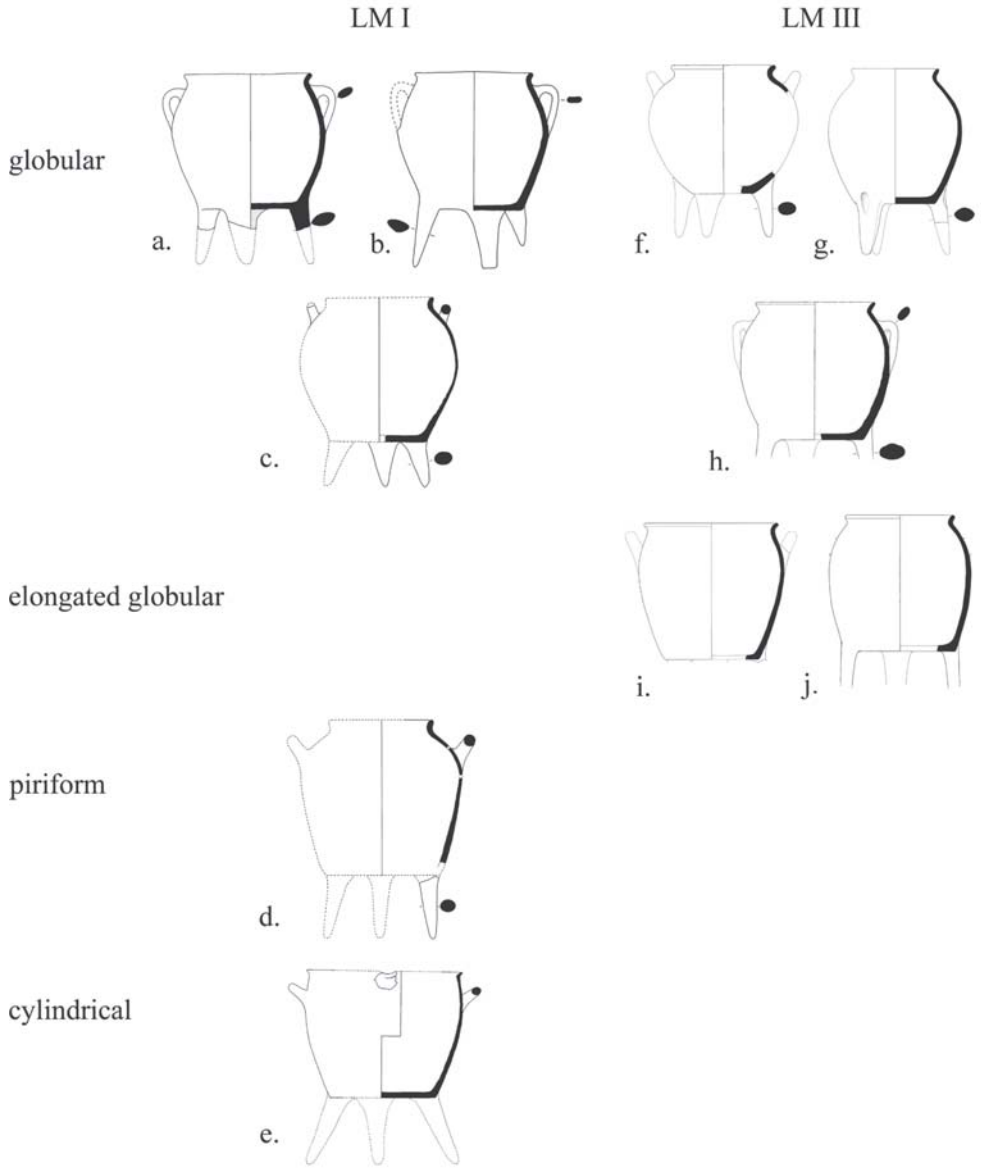

Figure 9.4. Mochlos LM IB and LM II–III tripod cooking pots (after Barnard and Brogan 2003, figs 47–49; Smith 2010, figs 82, 83). LM IB: a. MOC0587 (IB.491); b. MOC1043 (IB.493); c. MOC0095 (IB.490); d. MOC2931 (IB.500); e. MOC3171 (IB.505). LM II–III: f. MOC3566 (IIB.863); g. MOC 6602 (IIB.877); h. MOC3371 (IIB.858); i. MOC 3991 (IIB.869); j. MOC 4004 (IIB.870)

This is not so with the cooking dishes, where two new types are introduced during the LM II–III periods. Cooking dishes are elliptical scoop-shaped vessels with rims of varied height and shape and very thin walls (Fig. 9.5a–b). Some have broad spouts that span the width of the vessel (Barnard *et al*. 2003). LM I cooking dishes have thickened, round rims that are often dated from the body on the exterior (Fig. 9.5a–b; *cf*. Barnard *et al*. 2003). In the LM II–III period, Types C and D are introduced alongside Type AB. Type C has a

thickened, square or round rim that is more or less flush with the vessel wall, while Type D has a relatively high, round or pointed, and straight rim (Smith 2010, 115). One shared feature is the textural difference between interior and exterior surfaces. The exteriors are rough compared to the smoothed "water-swiped" or polished interiors (Betancourt 1980; Popham 1984; Barnard *et al*. 2003; Smith 2010, 115–118). The stark contrast between the surfaces may be a result of how the vessel was most likely produced, by pressing clay into a mold with a rough texture and smoothing the exposed surface (Betancourt 1980; Morrison *et al*. 2015).

Cooking trays are circular and shallow with straight walls and flat bottoms (Fig. 11.6). Some have two handles located opposite each other, occasionally with a pulled spout between (Barnard *et al*. 2003; Smith 2010, 119). There is one LM II-III tray with vertically set handles that rise above the rim (Smith 2010, 119). Handles are round horizontal, oval vertical, or elongated lugs that may be pierced (Barnard *et al*. 2003, 86). A distinct LM I feature includes isolated or triple sets of knobs set at the rim between the handles (Barnard *et al*. 2003, 86).

The ceramic evidence indicates that new fashions of serving and consuming were adopted over time (Brogan *et al*. 2002; Smith 2010, 126–128), but the foodstuffs may not have differed (Reese *et al*. 2004, 2011). LM IB accessory cooking equipment includes scuttles, presumably used to move hot coals about (Barnard *et al*. 2003). These were also present in LM II–III deposits, along with at least one portable hearth and spit-rest similar to Scheffer's Type A (Scheffer 1984, fig. 1a; Soles *et al*. 2011). Spit-rests are paired vertical slabs impressed with notches evenly spaced along the top, where skewers with meat could have been placed above hot coals for grilling (Blegen and Rawson 1966, 418; Lis 2006; Hruby 2008). LM IB eating, drinking, and serving equipment includes cups and bowls (Fig. 9.7; Barnard *et al*. 2003). In the LM II–III period, conical and ogival cups are still used, but variant bowl types emerge (*e.g*. pulled-rim, shallow, deep), along with kylikes, loop-handled dippers, and kraters (Fig. 11.8) (Smith 2010, 9–15, 57–64, 130–136). The presence of such LM II-III objects is in keeping with contemporary sites where possible Mycenaean influence is felt, *i.e*. Palaikastro (Sackett and Popham 1965, 1970), Petras (Tsipopoulou 1997), Knossos (Warren 1997), Kommos (Watrous 1992, 2006), and Khania (Hallager 2000; 2003; 2011).

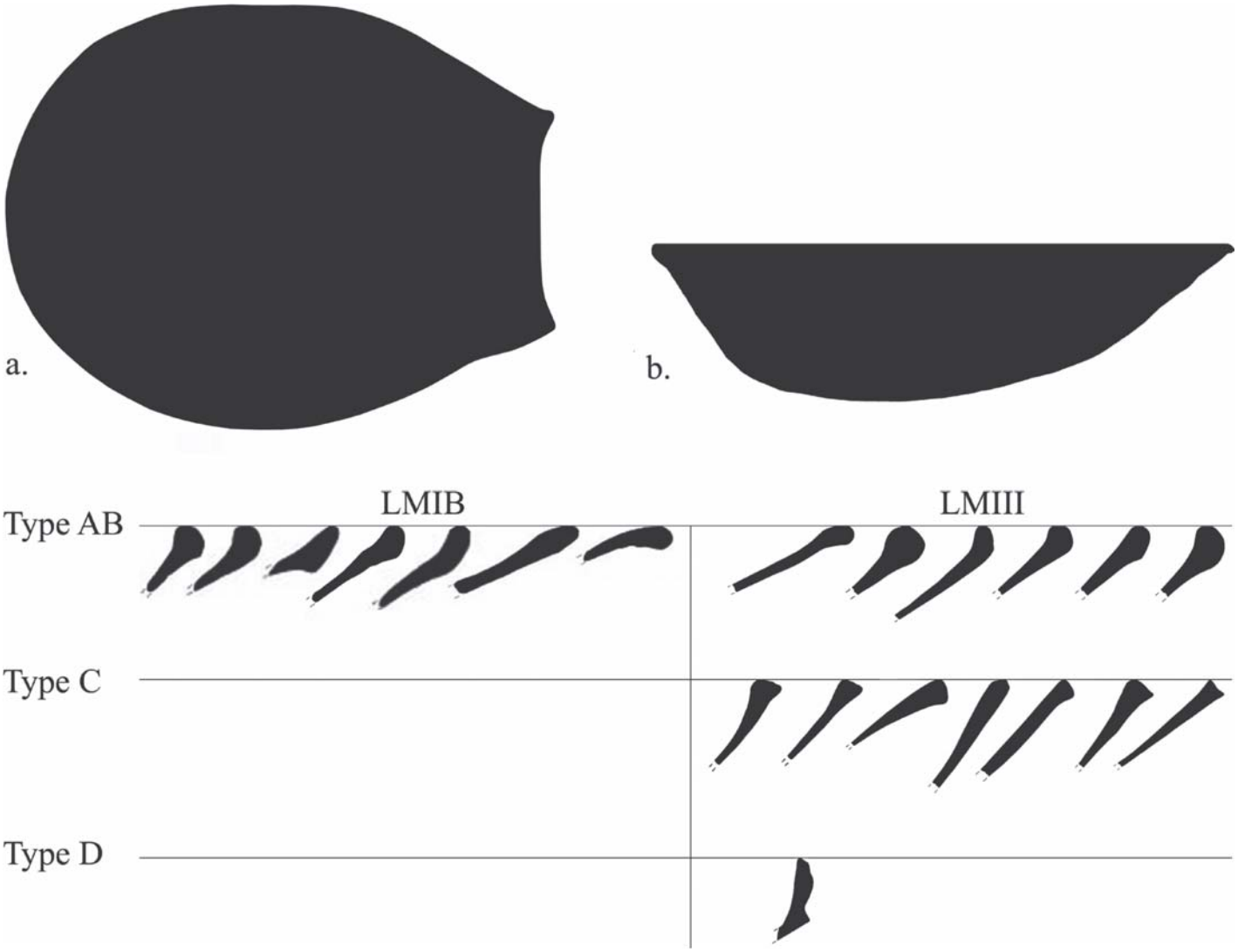

Figure 9.5. Mochlos LM IB and LM II–III cooking dishes (after Barnard and Brogan 2003, fig. 50; Smith 2010, fig. 84): a. a top view of a cooking dish; b. a side cross-section of a cooking dish

Cooking installations also changed during the LM period. LM IB cooking deposits are identified by a concentration of cooking equipment, food remains and charcoal (Brogan and Barnard 2011). LM II–III cooking deposits are identified by the same components but also include architectural remains of built hearths, cooking holes, and cook sheds (Soles 2008, 8, 54–56, 69–70, 86, 98–99, 114–119, 123–125, 188). These structures are not present in all houses. To better understand cooking practice, deposits from the LM IB Artisans' Quarters, the Chalinomouri farmhouse and the LM II–III settlement are examined.

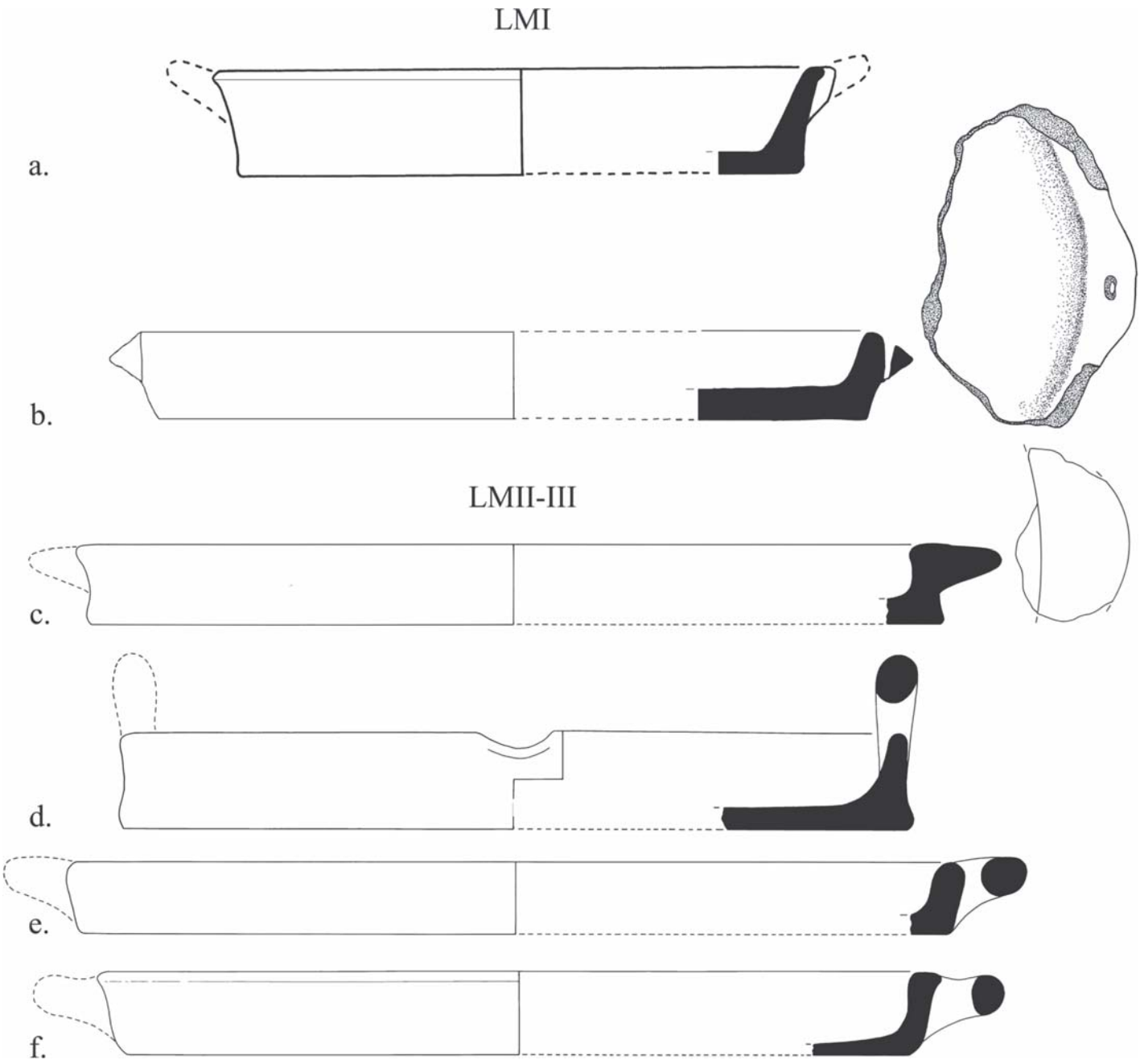

Figure 9.6. Mochlos LM IB and LM II–III cooking trays (after Barnard and Brogan 2003, fig. 51; Smith 2010, figs 85, 86). LM IB: a. MOC0570 (IB.583); b. MOC0474 (IB.582). LM II–III: c. MOC6018; d. MOC1595 (IIB.946); e. MOC0342 (IIB.943); f. MOC0147 (IIB.942)

Mochlos LM IB cooking deposits

LM IB cooking deposits from the Artisans' Quarters (Fig. 9.9) and the Chalinomouri farmhouse (Fig. 9.10) are identified primarily indoors, yet individuals also cooked outside (Soles 2003, 7–38, 43–87; Brogan and Barnard 2011). In most cooking spaces, tools for craft production were also present, indicating that areas could be multifunctional and communal. For example, the largest interior area within the craft compound is Room 10 in Building B. Alongside cooking equipment, eating, serving and storage vessels are present, as are loom weights, ceramic work slabs, and a potter's wheel and bat. In the nearby Room 2 (Building B), numerous cooking pots, eating and drinking vessels sit alongside stone tools for food processing, craft tools for weaving and metalwork, as well as a scuttle and possibly the remains of a shrine (Soles 2003, 43–87). In

Building A, Room 2 provides another example where a considerable amount of cooking equipment is found with vessels of various types, loom weights, and tools for metalwork (Soles 2003, 7–35). Multifunctional spaces are also found at the Chalinomouri farmhouse and in many of the LM II–III dwellings (Soles 2003, 103–125; 2008, 5–128).

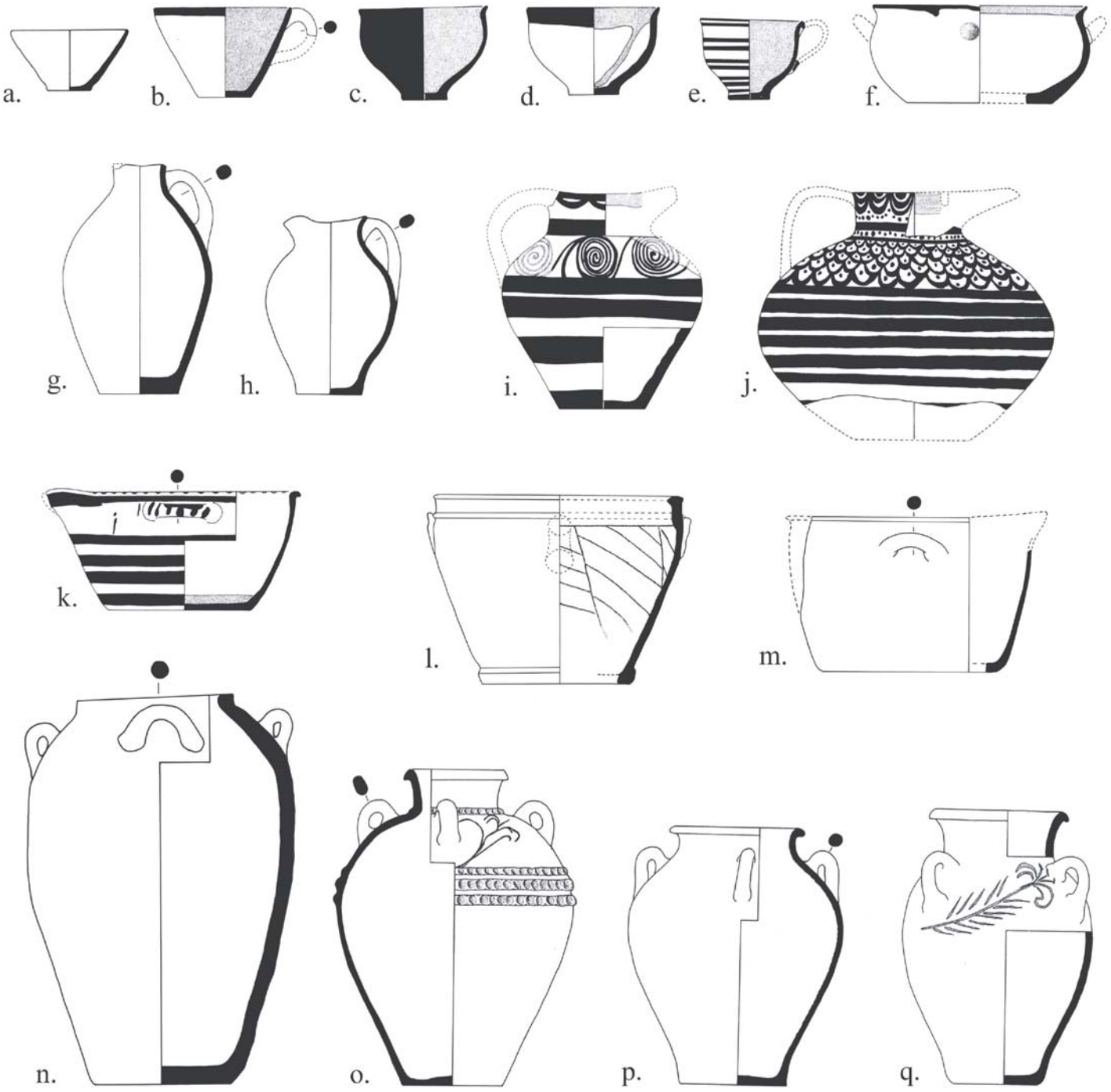

Figure 9.7. Mochlos LM IB cups, bowls and vessels used for serving, food preparation, and storage (after Barnard and Brogan 2003, figs 2–4, 9–11, 13, 14, 22–25, 44–46): a. conical cup (IB.57); b. large decorated conical cup with handle (IB.148); c–d. ogival cups (IB.178, IB.161); e. bell cup (IB.225); f. knob-handled bowl (IB.243); g–j. jugs (IB.336, IB.329, IB.323, IB.328); k. spouted bowl (IB.241); l–m. basins (IB.270, IB.274); n–q. pithoi (IB.445, IB.412, IB.413, IB.414)

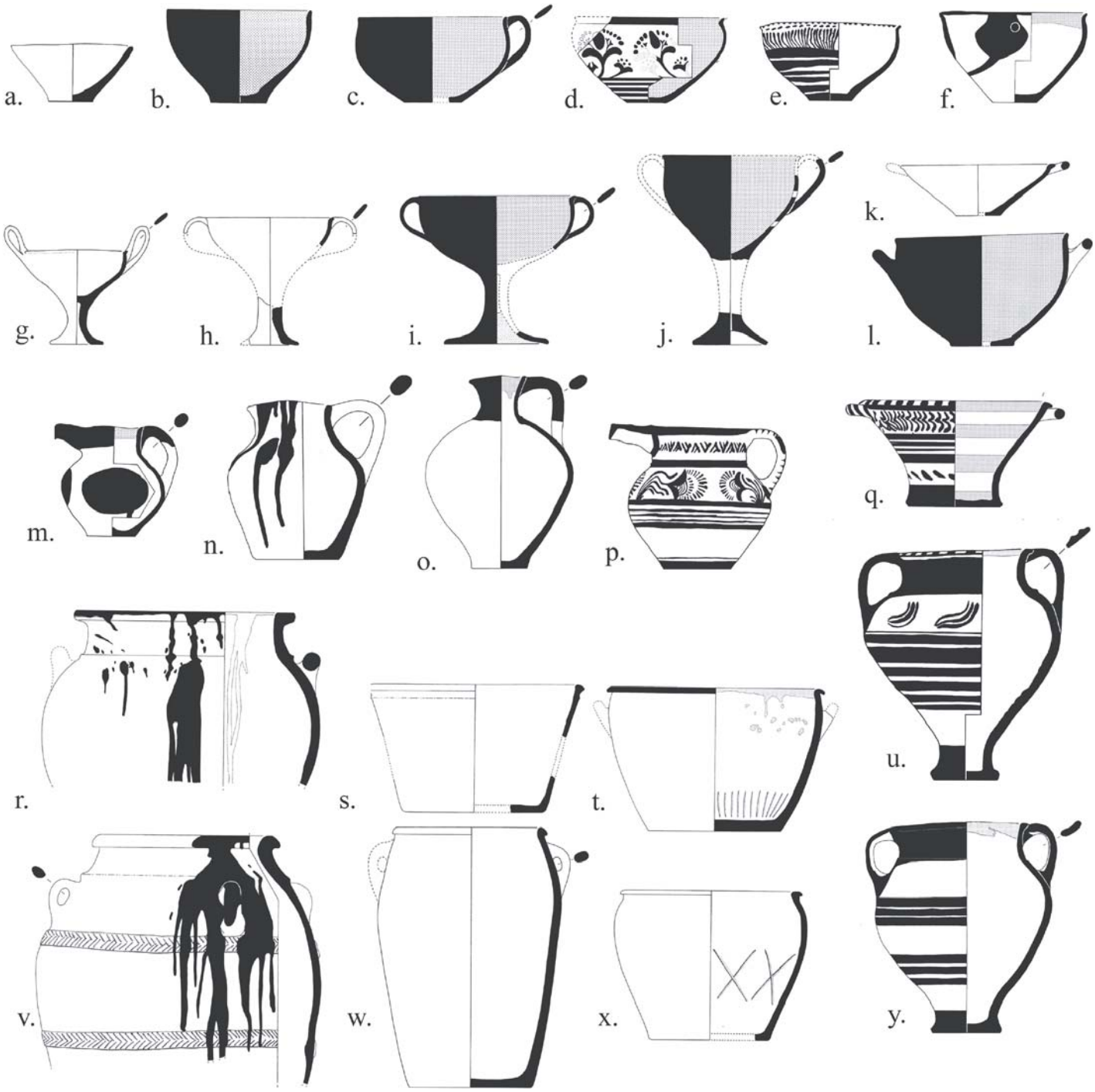

Figure 9.8. Mochlos LM II–III cups, bowls and vessels used for serving, food preparation, and storage (after Smith 2010, figs 1, 3, 5, 7, 8, 15, 16, 18, 20, 23–28, 30, 32, 33, 64, 73, 74): a. conical cup (IIB.13); b. ogival cup (IIB.77); c. deep cup (IIB.117); d–e. pulled-rim bowls (IIB.108, IIB.302, IIB.306); g–j. kylikes (IIB.165, IIB.207, IIB.209, IIB.168); k. shallow bowl (IIB.454); l. deep bowl (IIB.466); m–p. jugs (IIB.610, IIB.596, IIB.597, IIB.608); q. kalathoi (IIB.495); u, y. kraters (IIB.505, IIB.503); (r, v, w. pithoi (IIB.819, IIB.822, IIB.769; s, t, x. basins (IIB.583, IIB.585, IIB.581)

Another Mochlos LM IB characteristic of space-use is that more than one cooking area is identified in every structure, indicating that either cooking spaces were relocated over time within the buildings (Brogan and Barnard 2011) or multiple spaces were used more or less simultaneously. For example, in the Artisans' Quarters Building B there are at least four spaces with abundant charcoal, tripod cooking pots, cooking dishes, trays, eating, drinking and storage vessels, and food remains, *i.e.* Rooms 2, 3, 10, and 13W. Room 3 is

an enclosed space that is accessible only through the roof (Soles 2003, 43–87). In Room 3 there is an exceptional find of a tripod cooking pot containing the butchered bones of two hares, an unidentified bird, a lizard or snake, and sea snails (Soles 2003, 119; Reese *et al*. 2004, 69). In Building A, the two relatively small enclosed Rooms 2 and 10, similar to Room 3 in Building B, also have abundant charcoal, food remains, cooking equipment, and numerous other vessels; various types of tools were also found. Very few ethnographic parallels are appropriate for these sorts of enclosed cooking and pantry spaces that are seemingly accessible only through an entrance cut into the roof. As no other LM IB cooking structures such as these have been published, more research must be conducted to understand these particular spaces.

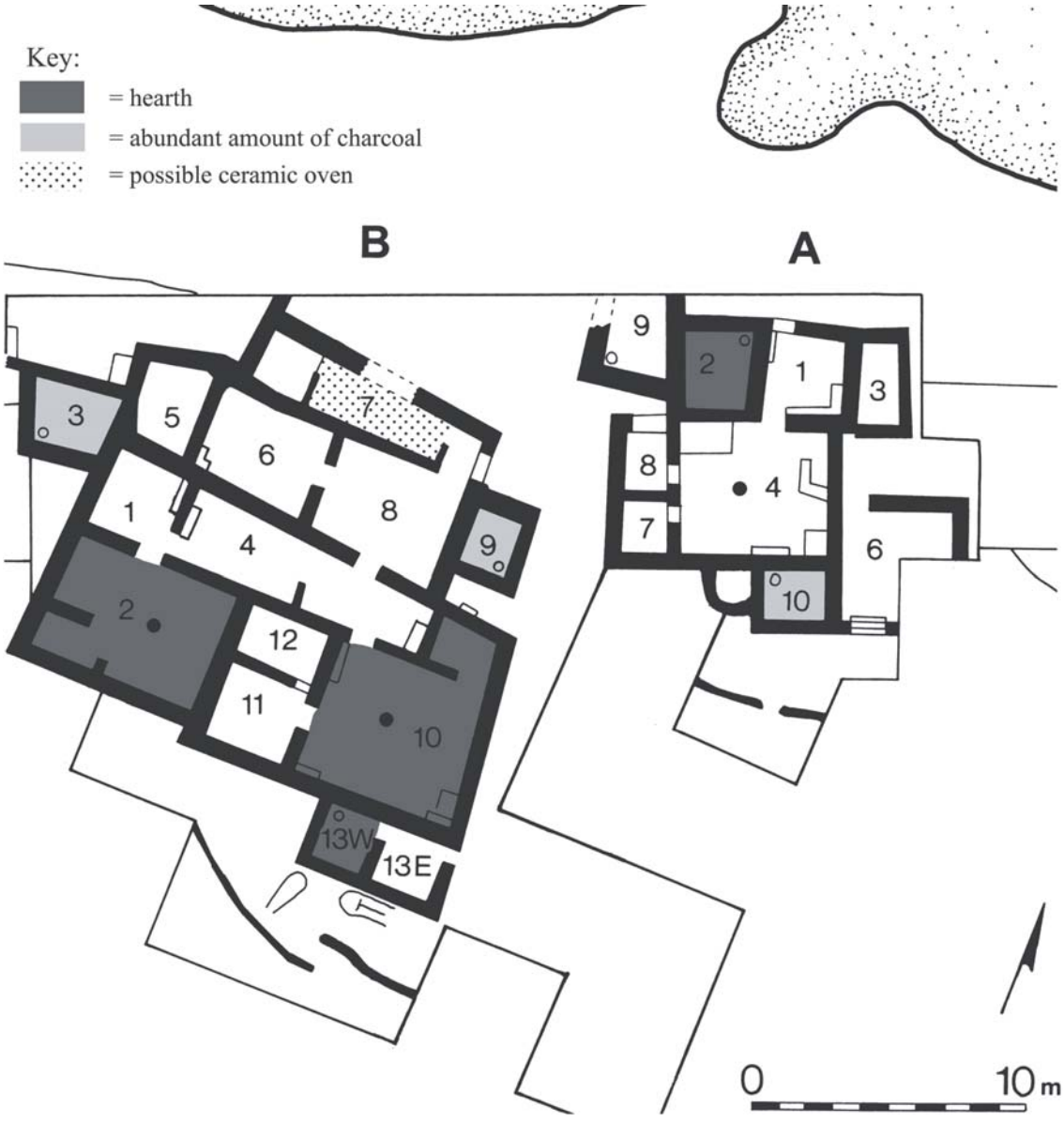

Figure 9.9. Mochlos LM IB Artisans' Quarters, after Soles 2003, fig. 4

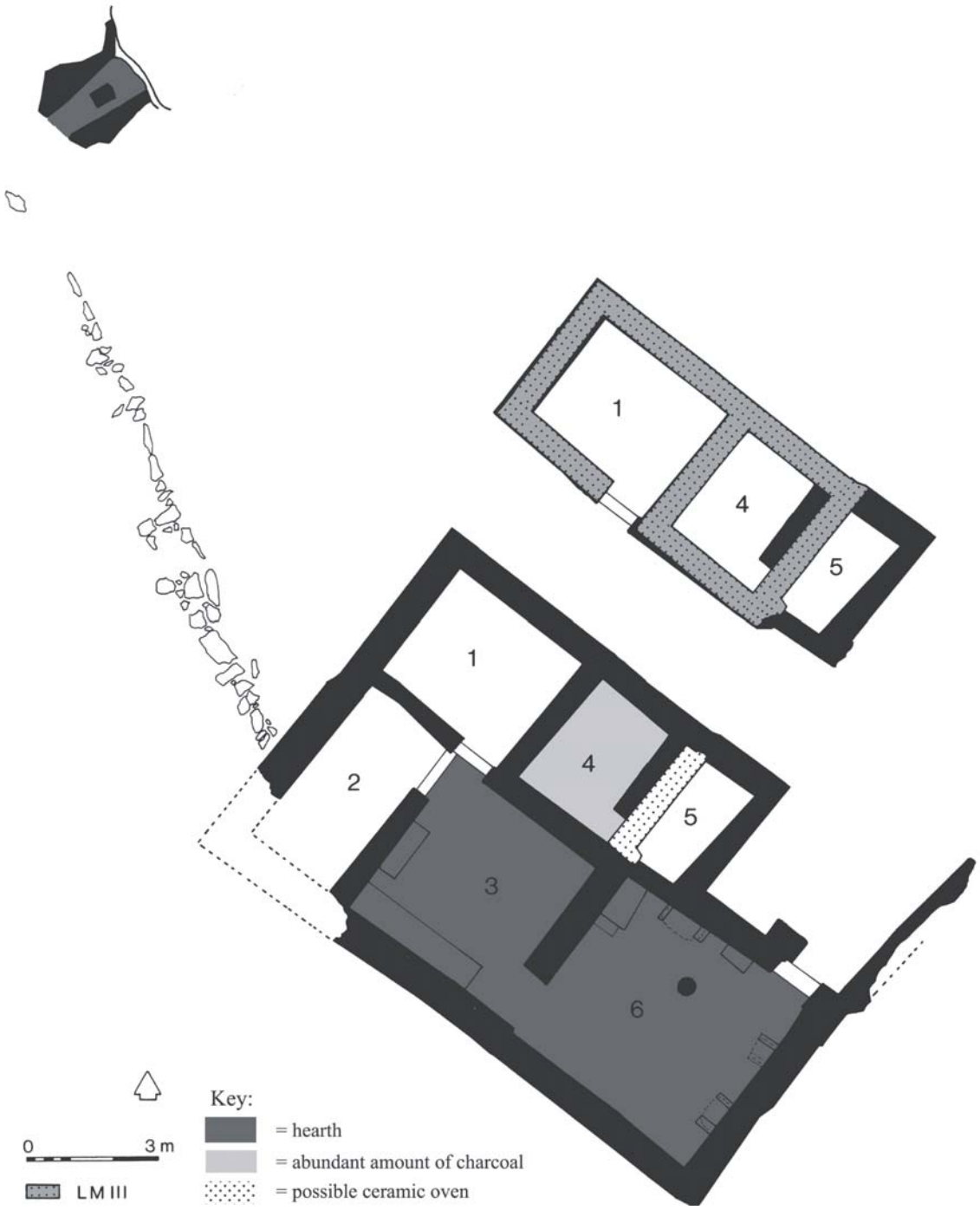

Figure 9.10. Mochlos LM IB Chalinomouri Farmhouse, after Soles 2003, fig. 56. LM III phases of Rooms 1, 4 and 5 are also illustrated, see key

In Building B, Rooms 2 and 10 are the largest. In Room 2, there is one scattered concentration of charcoal, whereas in Room 10 there are two, one in the southeast and the other in the northeast corner. Both rooms have at least one tripod cooking pot and one or more cooking dishes and trays, indicating that a range of cooking techniques was practiced (Soles 2003, 43–47; Morrison *et al*. 2015). Fish bones and shellfish are present in both rooms, but the only sheep/goat bones were in Room 10, along with olive, plum, and almond stones (Soles 2003, 43–87). At the southeast corner of Building B is an attached annex (Room 13); here, concentrations of charcoal, two tripod cooking pots, a tray and fragments of at least one cooking dish were found alongside fish bones and a few sheep/goat bones.

At the Chalinomouri farmhouse (Fig. 9.10) five out of six rooms have food-related activities; the two largest spaces (Rooms 3 and 6) are adjacent and identified as multipurpose and communal. Craft production most likely also took place here, based on the presence of loom weights and polishers for stone vase production (Soles 2003, 107–112). In Room 3, the corner hearth had charred pig bones with fragments of cooking dishes close by (Soles 2003, 112), strongly suggesting that meat was grilled indoors over the hearth, a cooking technique that does not require a vessel. Opposite the hearth in front of benches were limpet shells (Soles 2003, 112), which could have been eaten raw or prepared in one of the dishes (Morrison *et al*. 2015). The associated vessels are scored basins, amphorae, and jars. Room 6 has four benches and a large stone platform to provide a congregational space. In the corner was a large hearth full of olive wood charcoal; around it were two tripod cooking pots and a cooking dish. The scattered food remains in the room consist of pig, sheep/goat, wild deer, hare, limpets, olive, figs, grapes, almonds, and legumes. A few cups and a jug were found, but no other tablewares; storage jars, amphorae, and a scored basin are also present (Soles 2003, 110). The legumes could have been simmered in the tripod cooking pots, and the meats and shellfish could have been stewed in the tripod cooking pot, sautéed, or dry roasted in the cooking dishes (Morrison *et al*. 2015).

In the LM IB period, the majority of Mochlos' cooking spaces were indoors. Multifunctional, communal spaces occur in both the Artisans' Quarters and the Chalinomouri farmhouse. There is also evidence for cooking outside, though it is more rare. Tripod cooking pots, trays, and dishes were often accompanied by other types of vessels and tools in the primary cooking areas in the Artisans' Quarters (*i.e*. Building B, Rooms 2, 10, 13W; possibly Building A, Rooms 2, 10). Sheep/goat, pig, hare, cattle and a small amount of deer (but only at Chalinomouri), shellfish, cereals, and legumes were part of the diet. All of these foodstuffs could have been prepared in tripod cooking pots, while the meat and shellfish could also have been prepared in cooking dishes (Morrison *et al*. 2015).

Mochlos LM II–III cooking deposits

People in the LM II–III settlement continued to utilize multifunctional indoor and outdoor spaces to process food, cook, and eat (Fig. 9.11; Soles 2008, 5–128). For example, in House Beta's cook shed, loom weights were found next to a cooking hole, along with multiple stone tools for processing food (Fig. 9.12; Soles 2008, 69–72). In the court of House Gamma, multiple loom weights are also found, along with a stone polisher, a balance-pan, food processing and cooking equipment, and eating and drinking vessels (Fig. 9.11; Soles 2008, 90–101).

Installations in the forms of semi-circular hearths, cooking holes, and cook sheds reflect how food activities were organized and what cooking techniques were used; however, not all dwellings appear to have had cook sheds or installations. In fact, the monumental House Alpha did not (Fig. 9.11; Soles 2008, 14–44). Here, cooking activities appear to have been conducted primarily indoors; compared to the other dwellings, few cooking pots or eating and drinking vessels were found (Soles 2008, 76–82). Likewise, House Delta did not have a cook shed. Rather, in Room 3 the remains of a semicircular hearth with fragments of mud plaster and burnt clay around its perimeter was found, along with butchered and burnt sheep/goat bones (Soles 2008, 82). The burn marks on the bones indicate that the meat was grilled or roasted (possibly in the cooking hole), rather than stewed in a tripod cooking pot. The only cooking equipment was located in Room 1, a tripod cooking pot and a spit-rest, accompanied by cups and bowls, pig, cattle, and sheep/goat bones, and limpet shells, together signifying that individuals cooked, ate, and drank here (Soles 2008, 77).

Houses Beta and Eta are dwellings within a cluster of six houses located in the settlement's center (Fig. 9.12). Ceramic vessels, charcoal, and food remains indicate that their inhabitants cooked, ate, and drank both inside and outside. Both houses had cook sheds with built hearths and cooking holes (Soles 2008, 60–72,

84–90). Additional activities were most likely practiced in these spaces, judging from the artifact assemblage: a loom weight, stone tools for food processing, and a knife and obsidian blades capable of various tasks declare that weaving and food processing could have been undertaken in the cook shed of House Beta. Only stone tools were found in the cook shed of House Iota.

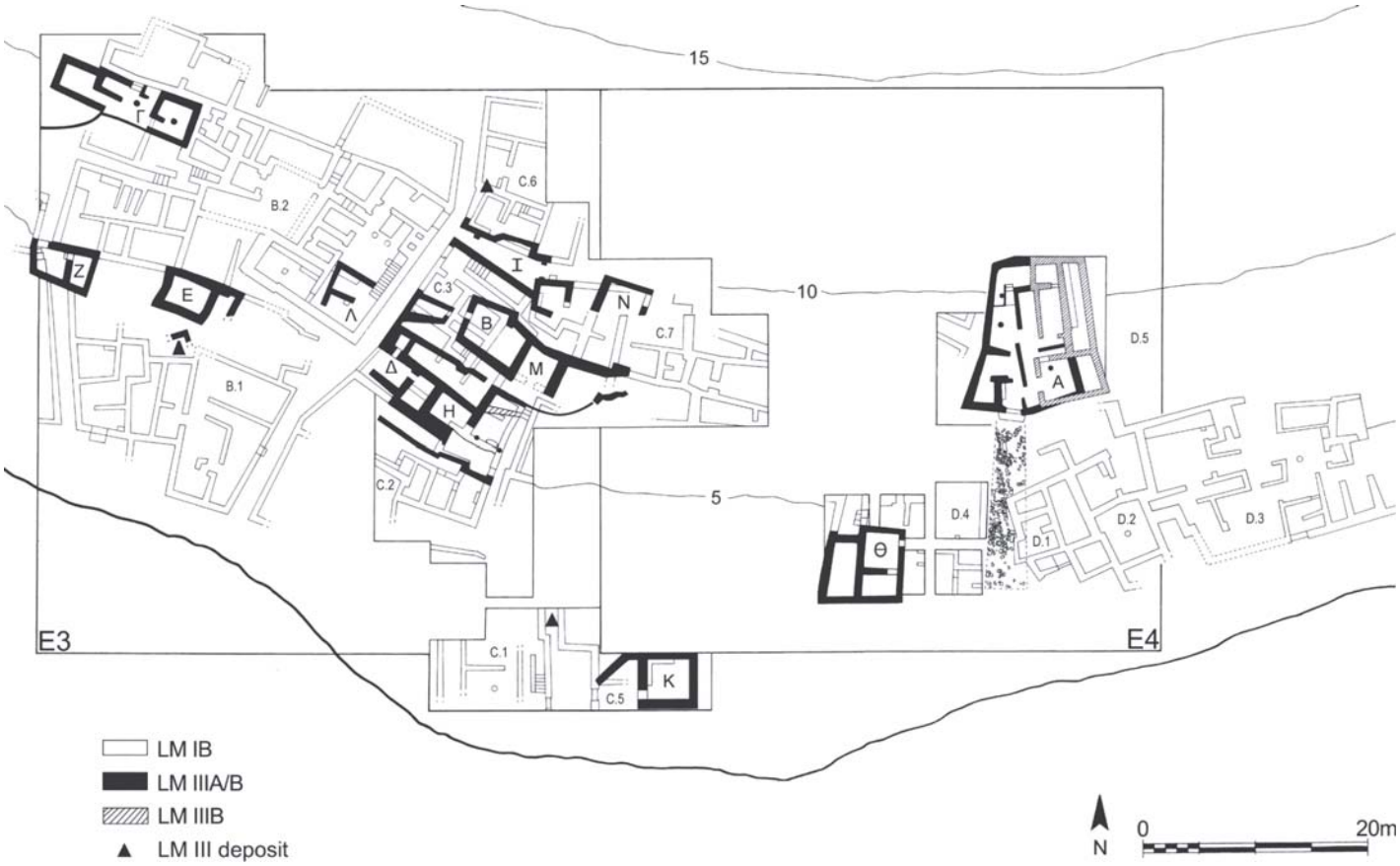

Figure 9.11. Mochlos LM II–III Settlement, Soles 2008, fig. 3

One question is, *how were fixed hearths and cooking holes used in the two houses?* House Beta is a rectangular building, with a main room and a cook shed located in the front yard (Soles 2008, 69, 70). Inside the cook shed is a hard-packed clay floor with preserved traces of white plaster; a low platform hearth is set in the northwest corner of the room with a dugout cooking hole (0.23–0.27m wide, 0.9m deep) lined with clay and a fired curved rim preserved *ca*. 0.05m high (Soles 2008, 70). Ash and coals filled the cooking holes. Butchered bones of cattle, sheep/goat, and pig were found in the surrounding yard (Soles 2008, 70–72). Cups, bowls, a dipper, and a krater were kept in the cook shed, with two cooking dishes, a tray, two cups, a storage jar, and an amphora in the main room.

Cooking dishes and trays, food remains, and a small amount of charcoal in the main room of House Beta indicate that people ate indoors; however, eating, drinking and serving vessels were located also in the cook shed (Soles 2008, 69–72). The remains of sheep/goat, pig, and numerous shellfish were found in the main room; these foods can be grilled, dry roasted, or lightly sautéed in open vessels, *e.g*. a cooking dish (Morrison *et al*. 2015). If foods were prepared in this manner in the cook shed, then carried to the main room to be consumed, individuals could have eaten from the cooking dish or trays using utensils, bread, or their fingers, or from the bowls stored in the cook shed. Eating utensils of organic materials like wood might once have existed and have subsequently been lost due to decomposition. Additionally, because cooking dishes and

trays are open vessels, they could have been used for a variety of tasks, *e.g*. holding lit coals to warm and dry interior spaces.

Tripod cooking pots were found in House Beta, and a small amount of fava beans was recovered in the main room. The presence of fava beans and the lack of deep-bodied vessels well-suited for stewing serve as a caution in adopting probably untestable interpretations. In the main room of House Beta were two large jars, possibly to store items such as fava beans, and in the cook shed were a grinder and handstones/hammerstones. Although today our first thought for a method to cook fava beans might be in soup, they can also be ground into flour that can then be used in a variety of ways.

House Eta is a smaller two-room complex, with a covered porch offering passage through to the main room (Soles 2008, 84, 85). The porch had two building phases. In phase 2, the north section was rebuilt and a cook shed was erected with a circular hearth in the southwest corner. Four stones created a cooking hole (*ca*. 0.35m diameter), though no trace of clay was found on the interior. Concentrations of charcoal and food remains, *i.e*. butchered bones of cattle, sheep/goat, and pig plus shell from shellfish, were located in both phases of the porch, along with cups, bowls, cooking dishes, and a tray. No food remains were found indoors (Soles 2008, 89, 90); these finds indicate that either the occupants kept a tidy house or they primarily ate and drank outdoors (Soles 2008, 86). Nevertheless, differences in the cooking assemblages between the two phases suggest that individuals could have cooked differently in phase 1 from in phase 2.

Figure 9.12. Mochlos LM II–III Settlement Houses Beta, Delta and Eta; details of cooking holes in House Beta cook shed and porch of House H, after Soles 2008, figs 29, 41A

In phase 1, three tripod cooking pots, three cooking dishes, and a tray, concentrations of charcoal, and a fragment of a portable ceramic hearth were unearthed on the porch. In phase 2, after the hearth and cooking hole had been constructed, no tripod cooking pots or portable hearths are known, but two cooking dishes and a tray are present. As previously discussed, the absence of tripod cooking pots, but the presence of a cooking hole, cooking dishes and trays is also observed at House Beta. It is possible that with the introduction of the cooking hole, individuals used tripod cooking pots less, preferring to roast or grill foods in the cooking hole. Another alternative is that cooking dishes and trays could have been temporarily installed over the cooking holes to sauté, grill, or roast food. Cooking holes in Houses Beta and Eta are between 0.23m and 0.34m in length (Soles 2008, 69, 70, 86), which creates an appropriate space for cooking dishes and larger trays to rest. Cooking dishes were found in House Eta, but none *in situ*, preventing any conclusion as to whether a specific type of cooking dish was associated with the cooking hole. Since at least two methods of cooking are attested, a smaller number of cooking pots does not necessarily mean that less food was being prepared; food could have been prepared in multiple ways, and some cooking techniques, like grilling, do not require vessels.

Houses Iota and Gamma also have cook sheds, but there is no evidence of a built hearth or cooking hole from either (Figs 9.11, 9.13; Soles 2008, 54–56, 90–91, 98–99, 114–119, 123–135). House Iota is part of the same central cluster of buildings as Houses Beta and Eta, while House Gamma is an independent structure located in the northwest corner of the settlement. This gives rise to the question, *how can a cook shed without a cooking hole be used?* House Iota is a long and narrow two-room structure with a partially enclosed cook shed on the southeast corner; it was occupied in the LM IIIA period (Soles 2008, 50, 51, 54, 55). It is located at the highest elevation of the central cluster of houses. Eating and drinking vessels, cooking pots and food remains were found inside the cook shed and in the east yard and corridor, indicating that individuals could have eaten inside the cook shed or outdoors, but most likely not in the main room (unless the occupants were especially tidy, because these items were not found here). Sheep/goat bones, shells of shallow-sea creatures, land snails, figs, and barley were scattered in the cook shed and yard. Only cooking dishes and trays were found, indicating that the occupants might have preferred grilling, roasting, or sautéing to boiling and stewing. This assemblage differs from the LM IIIA deposit of House Eta, where on the porch the occupants had all the cooking pot types: three tripod cooking pots, three dishes, and a tray. The presence of a handstone/hammerstone, a saddle quern, and obsidian blades inside House Iota's cook shed suggests that this space was primarily used for food processing. Concentrations of charcoal, stone tools, storage jars, and cooking pots in the east yard adjacent to the cook shed and in the east corridor indicate that the outdoor spaces were primarily used for cooking, food preparation, and possibly storage.

House Gamma is a long rectangular structure located in the northwest area of the settlement; it, too, was occupied in LM IIIA (Soles 2008, 90–101). It is divided into three sections: Rooms 1 and 2 at the western and eastern ends, and the cook shed and paved courtyard in between. Eating, drinking, possible food preparation, and weaving were activities practiced in Rooms 1 and 2, whereas the exterior spaces (*i.e*. southwest terrace below house, court) and cook shed were primarily used for cooking and food preparation. Loomweights were found in both phases of the court, indicating that weaving was also practiced here. The abundant amount and varied collection of food remains, in the form of cattle, sheep/goat, pig, fish, edible mollusks, limpets, figs, and grapes, in addition to charcoal in the cook shed, indicate that this space was the primary kitchen and that the court and southwest terrace were used when needed or desired.

The occupants of House Gamma ate, drank, cooked, and consumed food in both indoor and outdoor spaces. Only one tripod cooking pot was found on the southwest terrace, together with a cooking tray, bowls, cups, a kylix, and a krater. This distribution could indicate that the occupants either cooked, ate, and drank on the terrace, or that food was prepared in the cook shed in the tripod cooking pot and then carried to the terrace to be eaten. The court outside the cook shed also had bowls, cups, and kylikes, but this time with cooking dishes instead of tripod cooking pots or trays. The presence of eating and drinking vessels along with the

cooking dishes could signify that the occupants preferred using vessels to hold an individual portion to consume rather than eating communally out of the dish with utensils, bread, or their fingers. It is also possible that the food served in the cooking dish was liquid-based and required cups and bowls. Indoors, a cooking tray was found in Room 1 along with the remains of sheep/goat and sea snails; two dishes were found in Room 2 with scattered remains of sheep/goat, hare, cattle, pig, and sea snails, all of which could have been prepared in the dish (Morrison *et al*. 2015). The occupants either kept their house relatively tidy, or in the final phase of the dwelling they mainly ate and drank outdoors; there is a limited number of eating and drinking vessels inside.

Contextualizing Mochlos LM cooking practices

The Minoan island of Crete and the Mycenaean Greek Mainland shared climate and landscape characteristics, which influenced the types of foods people accessed and how they cooked. These regions had a Mediterranean climate and varied landscapes (*e.g*. mountain ranges, fertile plains, woods, coastlines), allowing individuals to practice food collecting, farming, hunting, and fishing. While there is a commonality in the ingredients used for cooking, there are definable differences between Minoan and Mycenaean cooking assemblages, indicating some cultural differences in how individuals prepared and cooked food. Much of what we know about domestic kitchens for these cultures comes from indirect sources (*i.e*. cooking and serving assemblages, floral and faunal remains, Linear B tablets, architecture) rather than explicit descriptions in literature or pictorial art. This evidence is explored below to compare differences in cooking style, with the primary emphasis focused on Minoan cooking pot assemblages as these have a bearing on interpreting the Mochlos LM II–III ceramic assemblage.

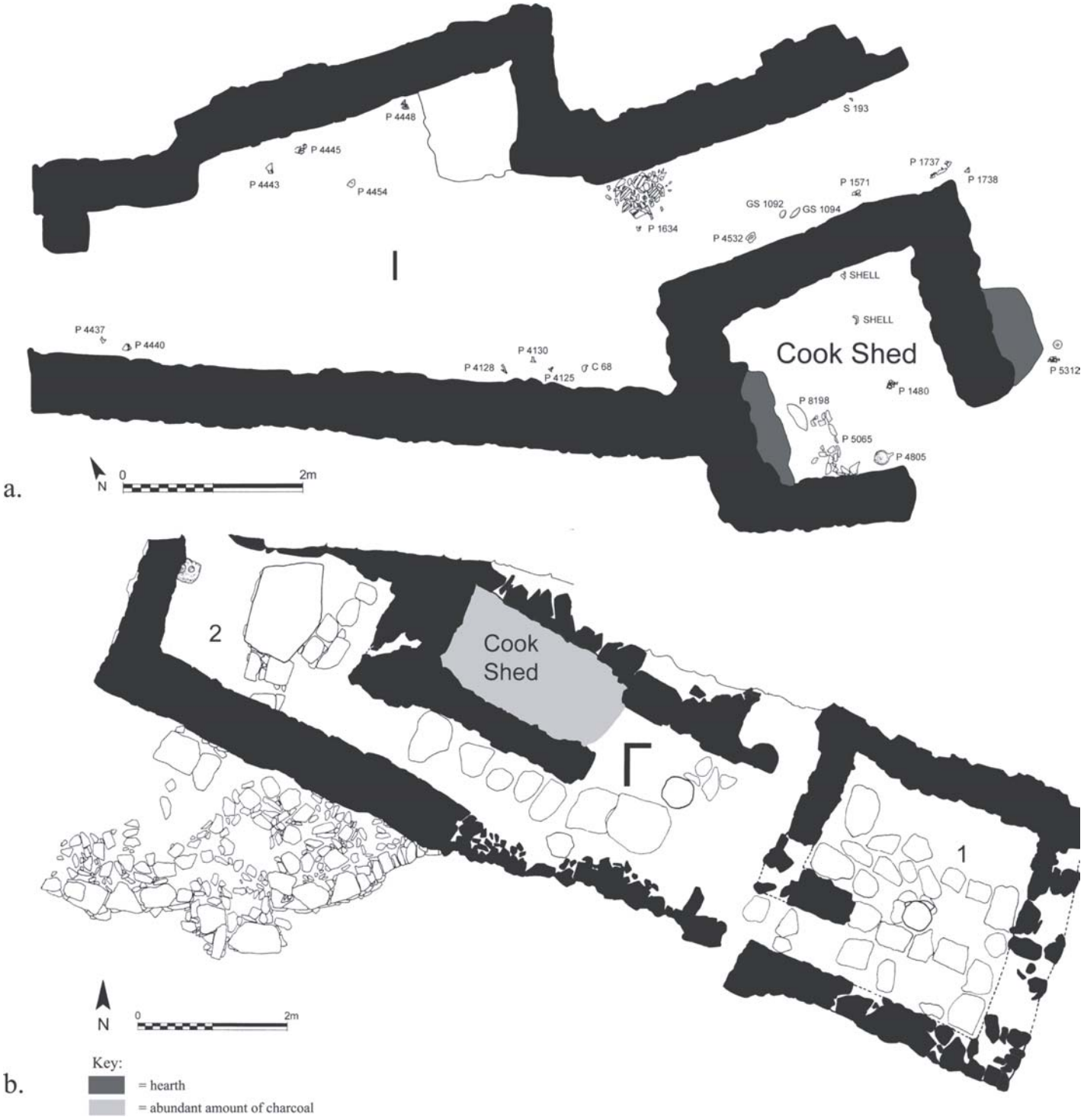

Figure 9.13. Mochlos LM II–III Settlement Houses: a. Iota; b. Gamma, after Soles 2008, figs 24, 66

Mochlos LM cooking assemblages are primarily comprised of tripod cooking pots, cooking dishes and trays, although spit-rests are identified in LM II–III assemblages as well. Mycenaean Mainland assemblages, by contrast, are comprised of cooking pots (*i.e*. tripod cooking pots, jugs, amphorae), cooking trays, griddles, and spit-rests (Furumark 1992; Hruby 2008; Lis 2008). The differences between the LM Mochlos and Mycenaean cooking assemblages suggest that the latter, with the introduction of griddles and spit-rests, is more focused on grilling and roasting. Griddles are flat, round trays with shallow rims and evenly spaced circular impressions on the top surface and blackened surfaces underneath (Hruby 2008; Lis 2008). Possible

functions of griddles include baking, frying, and roasting (Blegen and Rawson 1966, 341; Hofstra 2000, 63; Hruby 2008; Lis 2008).

A range of cooking techniques and cooking styles could have been utilized during the LM period on Crete. For example, cooking experiments demonstrate that the deep-globular shape of tripod cooking pots is best for boiling and simmering or stewing, while the shallower cooking dishes are best suited for frying, roasting, and baking (Morrison *et al*. 2015). Tripod cooking pots dominate the Mochlos assemblages, suggesting that it was a common practice for individuals in the LM period to prepare food by stewing when using ceramic utensils. This cooking technique was also practiced on the Mycenaean Mainland, but the cooking pot assemblages for stewing are more varied and include tripod cooking pots in addition to cooking jugs and amphorae (French 1967, 177; Mountjoy 1993, 117, 188; Tournavitou 1995, 92, 93; Lis 2006; 2008).

Applying the knowledge gained from experimentation with LM vessels to the diversity of cooking pots in the Mycenaean assemblage suggests that individuals could have used different techniques to heat deep, globular-shaped cooking pots. For example, if one cooked using a Mycenaean cooking jug, the side of the vessel opposite the handle could be placed close to a lit hearth to warm it, rather than surrounding it with hot coals like the technique used in experiments to heat Minoan-style cooking jars without legs (Morrison *et al*. 2015). To regulate the heat within the vessel, fuel could be added or removed from the hearth, the contents within the cooking pots could be stirred, or the vessel could be moved using the handle. Cooking experiments indicate that the handle remained at a sufficiently low temperature to allow the vessel to be moved from one location to another, while the bodies of the cooking pots are typically too hot to touch with bare hands (Morrison *et al*. 2015). Researchers examining Mycenaean Mainland cooking pot material have noted discoloration created by fire on the lower body of cooking jugs opposite the handles (Tzedakis and Martlew 1999; Yasur-Landau 2003; Lis 2008; Kanta and Kontopodi 2011) indicating that this hypothesis of how to cook using a jug has some validity. This pattern of discoloration is also located on the lower bodies of Mycenaean amphorae between the handles (Tzedakis and Martlew 1999; Dabney *et al*. 2004; Kanta and Kontopodi 2011) suggesting that to heat the vessels, a user would pick them up by the handles and place them alongside the fire so that neither handle is particularly close to the hearth. The contrast between the discoloration and the morphologies of the LM cooking pots and the Mycenaean Mainland cooking jugs and amphorae indicate that individuals of these two civilizations stewed food using different techniques.

New fashions of serving and consuming foods are present in the Mochlos LM II–III domestic assemblages (Brogan *et al*. 2002; Smith 2010, 126–128), but the foodstuffs may not have differed (Reese *et al*. 2004; 2011). Additional accessories and serving utensils produced and consumed locally are pulled-rim bowls, kylikes, kraters, scoops, dippers, and ladles (Smith 2008, 61–65), as well as portable hearths and spit-rests (Soles *et al*. 2011, 60). The presence of these objects parallels other sites where Mycenaean influence is evident, such as Khania Kastelli in West Crete (Hallager 2003, 2011) and Kommos in Central Crete (Watrous 1992; Rutter 2004; 2006). Souvlaki trays, dippers, and ladles are present in limited numbers in the LM II–III Mochlos assemblages, suggesting that perhaps only specific dwellings had these items.

Between the LM IB Artisans' Quarters and Chalinomouri farmhouse and the LM II–III settlement there is a marked shift in domestic architecture, resulting most likely from a Mainland Mycenaean influence (Brogan *et al*. 2002; Soles 2008). In the LM IB period, the houses were multi-roomed, and cooking spaces were primarily located indoors in communal and multifunctional spaces, as suggested by the presence of objects like loom weights, a balance-pan, and stone tools found together with food and cooking equipment; yet concentrations of charcoal and food and cooking pot remains also support outdoor cooking. This contrasts with the one-to-three room structures built in the Mochlos LM II–III settlement, where several are distinguished by a cook shed located in an adjacent space (Soles 2008, 8). Cooking areas in the LM II–III settlement are identified indoors and outdoors by concentrations of charcoal, food, and cooking pot remains, but also by built structures such as cooking holes or hearths located on porches and inside cook sheds (Soles

2008). The presence of fixed hearths in cook sheds, rather than within the main houses, indicates that most likely their primary function was cooking, rather than providing heat or light. Fixed hearths at Mochlos resembled those in use on the Greek Mainland and found *e.g.* at Mycenae, Tiryns, Korakou, and Nichoria, where they were were large, square-to-round in shape and constructed with a layer of clay over a bed of cobbles or sherds (Tournavitou 1999). In Crete, this hearth-type continued into the LM IIIC period in settlements that have a strong Mycenaean presence, such as Halasmenos, Kavousi, Vronda, Kastrokephala, and Kastelli Khania (Kanta and Kontopodi 2011).

LM II–III occupation at Mochlos took place 30–40 years after the destruction and abandonment of the Neopalatial town, arguably when the Mycenaean Greeks are believed to have been in control of Central Crete and were expanding into the East (Soles 2008, 1–5). There are distinct differences between the LM IB and LM II–III material culture at Mochlos; those taken into consideration for domestic cooking in this paper are ceramic cooking assemblages and architectural features associated with cooking activities. Architectural features reflect these changes in the physical environment surrounding the cooking processes clearly. New additions in the LM II–III ceramic cooking assemblages such as spit-rests, dippers, and ladles certainly exist, but they were produced and consumed locally *alongside* vessels with a clear and strong LM I pedigree. Mycenaean-style cooking pots (*i.e.* jugs, amphorae, griddles) that are present at other Cretan sites are absent at Mochlos; yet other Mycenaean imports and locally made Mycenaean-style products are present in other areas of the Mochlos settlement and cemetery (Smith 2005; 2010; Soles 2008; Nodarou 2010; Soles *et al.* 2011). Mycenaean influence on Crete is evident not only in iconography (*e.g.* Knossos frescos) and the adoption of the Linear B script, but also in styles of cooking.

This paper demonstrates that in the case of Mochlos, the LM II–III settlement appears to have a fusion, or entanglement, of practices, with the adoption of some Mycenaean cooking styles alongside established Minoan cooking traditions. Mochlos' LM II–III inhabitants may have been essentially Minoan but were influenced by some Mycenaean ways of cooking and eating, or alternatively could have been a mixed community including Mycenaean elements who also used Minoan cooking techniques. The fundamental ways of cooking at Mochlos seem to be embedded in Minoan culture with a seasoning of foreign influence.

Notes

I would like to thank Jeff Soles, Tom Brogan, Chrysa Sofianou, Angus Smith, and Kellee Barnard for sharing and discussing hypotheses about Minoan daily life in East Crete. Since 2004, they have made researching the people of Bronze Age Mochlos both fruitful and enjoyable. Additionally, I would like to acknowledge Jeremy Rutter for his inspirational article (2004). His ceramic study has influenced the way I contextualize ancient pots unearthed in archaeological sites to better answer anthropological questions. Last, I am indebted to Ian Whitbread, Don Evely, and Jenny Moody for their continuous support.

10

Cooking vessels and cooking installations in the Mediterranean Bronze Age: A comparative evaluation of household practices in LM IIIC Crete and LBA Italy

Elisabetta Borgna and Sara T. Levi

Introduction[1]

In this paper we discuss some archaeological contexts illuminating cooking equipment in both Italy and Crete. Our aim is to highlight meaningful aspects of convergence between the Aegean and the Central Mediterranean at the close of the Late Bronze Age, when episodes of interaction and mobility of individuals, objects and cultural features – multidirectional and overlapping phenomena of "cross-cultural migration" (Manning 2013, 6–10; Webb and Frankel 2011, 29) – deeply affected the everyday lives of members of communities on a Mediterranean scale.

Evidence for Aegean interaction in Italy

The widespread distribution of Mycenaean pottery in several Italian coastal sites and the influence of Aegean technological patterns on local pottery production indicate profound interaction between Italy and the Aegean world from *ca*. 17th–11th century BC (Italian Middle–Late Bronze Age) and with particular intensity toward the early Italian Late Bronze Age (13th–12th century BC; Jones *et al*. 2014 with references). The interaction in the domain of pottery involved both traders for the import of Mycenaean vessels and craftsmen for the local manufacture of ceramics of Aegean type (Italo-Mycenaean and other wares; Jones *et al*. 2014, 18–19).

However, this interaction does not seem to have had an impact on the production of kitchen wares; household practices, including the preparation of cooked food, seem to have remained largely unaffected by the impact of Aegean patterns of behavior. Admittedly, imported Mycenaean cooking vessels are rare in Italy; aside from a coarse wheel-thrown (not wheel-fashioned, see Choleva 2012) jar from Broglio di Trebisacce

(from the so-called *Casa Centrale*, dating to the early Italian Late Bronze Age or "Bronzo Recente", *ca*. 13th century; Jones *et al*. 2014, 34, 323, 417, 419), two tripod cooking pots, respectively from Aegina and Rhodes,[2] with coarse and abundant temper, have been detected at Scoglio del Tonno, where a few locally-made items are also attested (Gorgoglione *et al*. 2006; Jones *et al*. 2014, 32–33, 163, 319, 417, 419; Borgna and Levi 2015). Such evidence is not surprising at Scoglio del Tonno, a site highly involved in the international network of exchange as a kind of emporial center or gateway community, where some Aegean people may have settled (Borgna 2013–2014, 117–118 with references).

The evidence for special cooking pots, such as those attested at Scoglio del Tonno, is exceptional in the context of Italian *impasto* pottery production (non-calcareous, handmade, mainly coil-built or using various pressure techniques, and burnished; Levi 2010): typically, the same vessels used for food transport, storage, processing, and manipulation would have served for cooking as well as for other domestic activities (Recchia 1997; 2004, 260; 2010).

Even the results of rare organic residue analysis suggest that no special shape was adopted exclusively for cooking (Evans and Recchia 2001–2003). In the few known prehistoric kitchen contexts (Cazzella and Recchia 2008b; Radina and Recchia 2010, 272–296), the pots are mostly provided with more or less continuously curving profiles without sharp angles and with flat bases; shapes are either open, with flaring walls, or closed but with a wide, unrestricted mouth. Walls are mainly undecorated and provided with a number of handles or lugs – usually set high on the walls – and, in several cases, with single relief ropes (Rice 1987, 207–243).

As for technical features, a major concern of ancient people producing and using pottery in Italy seems to have been obtaining vessels well-suited for easy and even conduction of heat and the successful transformation of food. For the coarse handmade pots, the thickness of the walls provided a major functional constraint (Rice 1987, 227). The deep impressions in the outer bottoms of some Bronze Age vessels may be interpreted as a device for reducing the thickness of the walls and facilitating the conduction of heat (Levi *et al*. 2011, 166, fig. 8,12; Fig. 10.1).

A cooking function has been inferred for some vessels by the recurrent presence of specific fabrics with abundant and large temper – mainly calcareous or volcanic – possibly reflecting a functional choice to resist thermal shock and to increase cooking efficiency (Levi 2010, 198). During the Italian Bronze Age a clear trend emerges toward a decreasing use of calcite and an increasing use of grog. The grog/calcite alternative has been discussed in some experimental studies; despite the fact that no major differences are observed, calcite appears to be more problematic in oxidizing firing conditions, for example, increasing the risk of surface spalling and breakage (Fabbri *et al*. 1997). Moreover, porous or rough (or less burnished) surfaces might have enhanced cooking properties (Rice 1987, 231–232) and are one of the main criteria used by Italian archeologists to distinguish cooking pots from other functional categories featuring similar shapes. Ambiguity in the terminology used by various scholars (Cocchi Genick 1999) reflects difficulty in identifying the functions of vessels using just shape as a criterion and not also technological features such as ceramic paste and surface treatment.

In sum, the lack of substantial clues for Aegean influence at the household level may confirm the hypothesis that, apart from the evidence of some particular contexts such as possibly Scoglio del Tonno, the Aegean presence in Italy, far from being represented by a "migrant package," was typically fuelled by socio-economic factors; Aegean vessels would have served as exchange goods, as a medium of value within a mostly unrestricted sphere of circulation, or, depending on time and contexts, as exclusive symbols of social display (Borgna 2013, 133–141).

Evidence of Italian interaction in the Aegean

Different conclusions are to be drawn for the Aegean world, as the impact of foreign behaviors in Aegean households seems to have been more substantial. Handmade Burnished Ware (hereafter HBW) and plain gray wares – mainly based on Italian prototypes – constitute well-known evidence (Bettelli 2010; Lis 2009; D'Agata *et al*. 2012; Borgna and Levi 2015, 124–131). Although no definite evidence for cooking has been detected so far in the most common repertoires of HBW shapes (Kilian 2007, 49–50; Jung 2012, 112), some vessels have been discussed in terms of their possible roles in food preparation practices (Stockhammer 2011, 236). The case of Tiryns may be used for testing hypotheses about patterns of use of HBW; the great quantity of foreign elements including HBW makes the Argolic citadel a particularly relevant context. In the Tiryns Unterburg, where some HBW jars were possibly associated with hearths (Kilian 2007, 49; Rahmstorf 2011, 118; Stockhammer 2011, 234–236), a few vessels are indeed comparable with Italian counterparts that could be interpreted as cooking pots (*e.g*. Kilian 2007, pls 6–10). In the main, however, HBW vessels seem to have been mostly suited either for transport, temporary storage or preparation, or service and consumption, activities that imply social visibility on a domestic scale (Borgna and Levi 2015, 128–129).

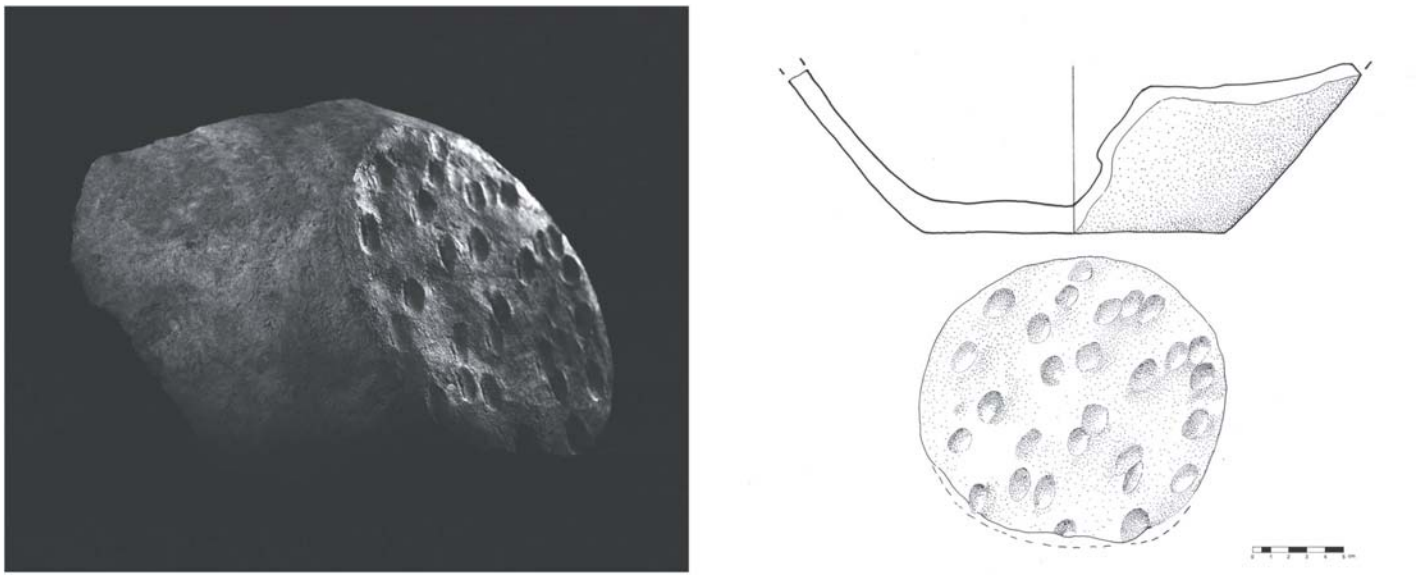

Figure 10.1. Deep impressions in the outer bottoms of a cooking pot associated with an Early Bronze Age squared oven with upright slabs at Stromboli (Aeolian Islands), inside Hut 2 (Levi et al. *2012, 347). Drawing by P. Vertuani, photo by E. Barbieri*

Cooking pots in LM IIIC Crete

In Post-Palatial or 12th century Crete, the focus of our comparative analysis, HBW is present at several sites; while there is no definite evidence for the use of HBW vessels as cooking pots (see however a kind of coarse cooking fabric used for a few HBW or related products; Kanta and Kontopodi 2011, 132; D'Agata *et al*. 2012, 316–319), wheel-made local cooking vessels are mostly represented in notable quantities at every site, thus ruling out the existence of any stress in the supply and distribution of specialized domestic wares.

The case of "Casa a ovest del Piazzale I" at Phaistos, an elite dwelling founded late in LM IIIB and lasting well into IIIC, seems indicative; though hints of interaction with the Central Mediterranean have been collected in several fields of activities (for metallurgy see Borgna 2001; 2007; 2012), cooking vessels appear well-rooted in the Aegean tradition. Only a portable oven/hearth or "fornello" (Fig. 10.2; Borgna 1997, 197, fig. 8; Borgna in press) seems to represent a shape attested sporadically in LM III Crete (Hallager 2003, 244 with references; Yasur-Landau 2006a, 237) and, interestingly enough, with good comparisons in LBA Italy,

as several examples from Frattesina, in the northern Adriatic, and southern Italy may testify (Moffa 2002, 59–82; Borgna in press).

The portable hearth from Phaistos, characterized by deep impressions or semi-perforations on the outer bottom, like a similar artifact from Tiryns (Kilian 2007, 27–28, pl. 21), may be compared with the abovementioned Italian vessels with impressions on the bottom (see Fig. 10.1). At the same time, it recalls the Mycenaean griddle or cooking tray, a shape found at several Mycenaean sites, distinguished by a series of relatively deep, hemispherical impressions in the upper surface; such a shape might have been used for cooking with fat to produce flat breads and other foods (for the debate, see papers by Hruby and by Gulizio and Shelmerdine in this volume). We cannot rule out the possibility that the object from Phaistos represents a hybrid dependent on foreign prototypes, based on a misinterpretation of the function of griddles belonging to the local Aegean tradition.

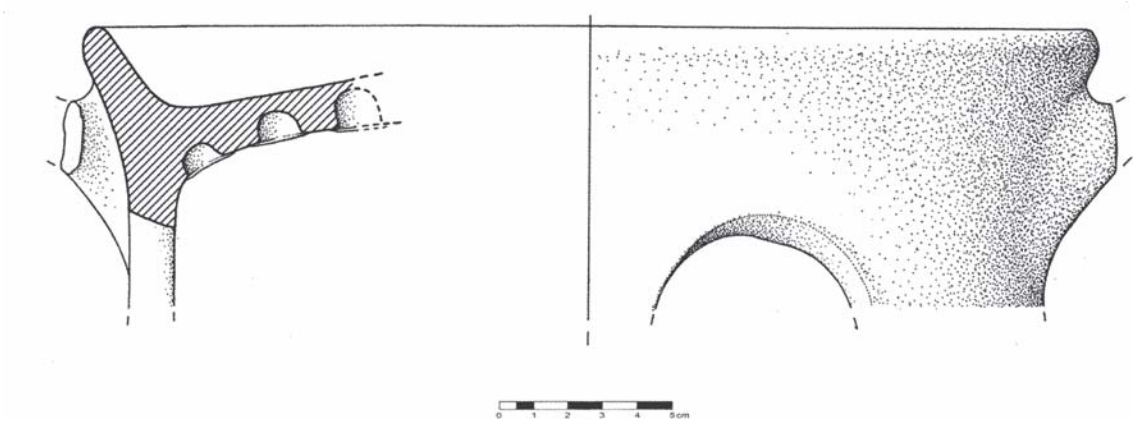

Figure 10.2. Portable hearth from Phaistos, "Casa a ovest del Piazzale I," LM IIIC. Drawing by G. Merlatti, archive SAIA, Athens

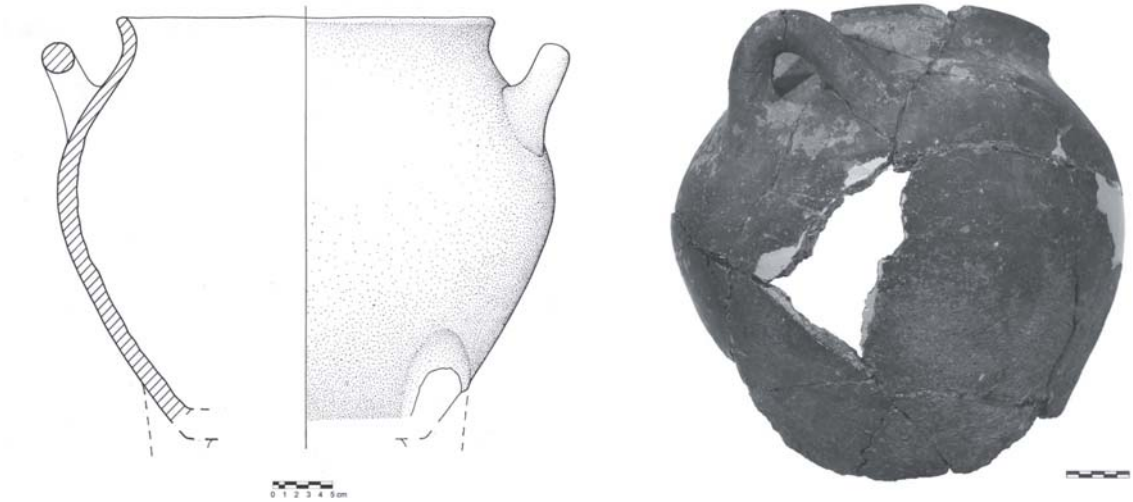

Figure 10.3. Tripod cooking pot from Phaistos, "Casa a ovest del Piazzale I" (Room 4), LM IIIC. Drawing by G. Merlatti, archive SAIA, Athens

This raises the possibility that the connection with distant cultural contexts may emerge from considering behaviors and patterns of use of material culture rather than by analyzing classes and types of objects. For this purpose, the LM IIIC cooking pots from Phaistos (Borgna 1997; 2004a; 2004b) have been

re-analyzed along two lines of investigation, consisting, on the one hand, of a visual examination focusing on ceramic pastes and traces of surface alteration (Hally 1983; Rice 1987, 234–236; Vidale 1990), and, on the other hand, of a morphological evaluation aimed at creating a functional typology.

A preliminary macroscopic classification of fabrics shows the existence of two main groups; Group 1 has a red or reddish-brown ceramic paste (10R 5/6; 2.5YR 5/6 5/8) with calcite and quartz inclusions, and Group 2 has rounded dark sedimentary rocks and a great variety of paste colors including pink and orange. Indisputable correspondences between fabrics and functions may not be drawn yet; it may be worth noticing a relatively high concentration in the first group of tripod pots (below, class A), vessels possibly associated with cooking practices implying direct exposure to flame and heat.

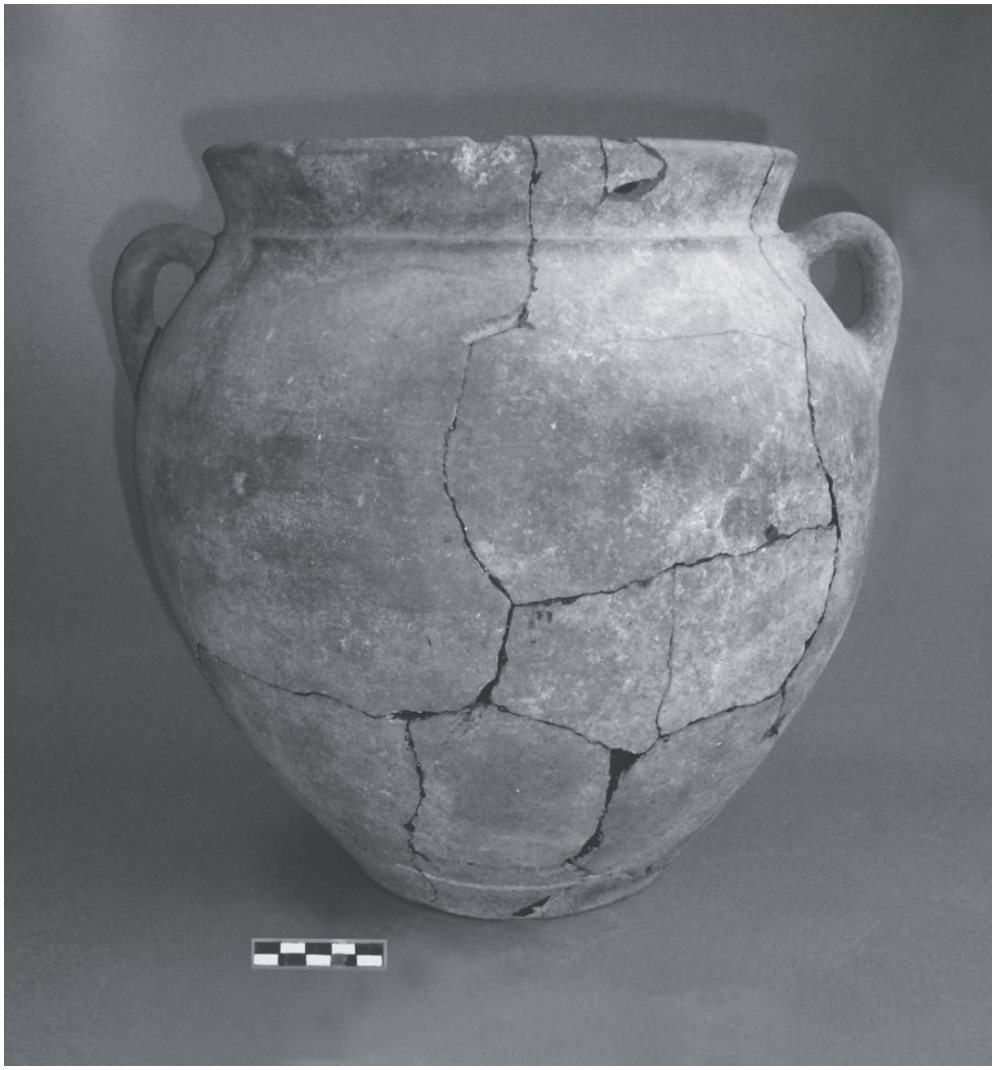

Figure 10.4. Cooking jar from Phaistos, "Casa a ovest del Piazzale I" (Room 5), LM IIIC early, with blackened upper walls. Photo by E. Borgna

The functional categorization advocated here involves exclusively wheel-made cooking pots, particularly well-represented in LM IIIC or the 12th century BC, which have been assigned to three main classes, possibly representing as many different uses in the ancient kitchen:

- globular tripod cooking jars provided with horizontal handles (Fig. 10.3);

- cooking jars with flat bottoms and vertical (or horizontal) strap handles on the shoulders (Fig. 10.4);
- cooking amphoras and/or jugs with thick roll or strap handles from shoulder to rim (Fig. 10.5).

The well-known tripod cooking jars (class A), well-rooted in the Minoan tradition and widespread in LM IIIC settlements (Borgna 1997, 200; Hallager 2000, 158; Yasur-Landau 2006a, 234–235), are well-adapted to outdoor use, mostly ceremonial and implying communal attendance. The huge dimensions of a few exemplars from the Casa Ovest seem to confirm that the kitchen in this building served an extra-domestic function (Borgna 2004a; 2004b). Large spots blackening most parts of the vessel and the heavily eroded surface of the lower body further suggest that tripod vessels were used in direct contact with open fires or embers (Fig. 10.3; *cf*. Yasur-Landau 2006b, 59; Skibo 2013, fig. 3.20). This culinary pattern obviously depended on the strategies of social and political control of the Aegean elites, acquainted with "haute cuisine" manners and with occasions and performances mostly based on the use of metal vessels such as huge bronze cauldrons; obvious differences in both the scale and volume of communal meetings and socio-economic organization might explain a possible low impact of this pattern in Italy.

Amphoras and jugs (class C; *cf*. Hallager 2000, 159–160; Yasur-Landau 2006a, 235–236; Day 2011, 318–319) mostly show evidence of cooking by placing the pots beside the fire, possibly partially in the embers at the edge of the hearth, as has been thoroughly described at LM IIIC Chalasmenos (Yasur-Landau 2006a; 2006b). Secondary exposure to fire cannot be detected over the entire outer surface; rather, scorch marks selectively affect one side of the vessel, or two opposite sides, in particular the lower walls. In a couple of vessels only one of the two handles is blackened on the back, so that it seems plausible that these vessels were placed with one of the handles immediately adjacent to the hearth (Fig. 10.5); the vessels could be moved easily using the handle opposite the heat source. Both amphoras and jugs fit with an indoor kitchen focusing on fixed hearths, possibly provided with benches or platforms, as plain bottoms suggest (Yasur-Landau 2006a, 238; Day and Glowacki 2012, 127). Furthermore, vertical handles are well-suited to horizontal manipulation, either for the purpose of stirring the contents or for actually moving the vessels. On average, amphoras and jugs in the Phaistos repertoire seem to be smaller than other cooking pots, thus suggesting everyday use within the household or food preparation for a numerically limited social group.

Figure 10.5. Cooking amphora, from Phaistos, "Casa a ovest del Piazzale I", LM IIIC advanced (Iraklion, Archaeological Museum): scorch marks on one side of the vessel. Photos by E. Borgna

Vessels and hearths in Crete, Greece and Italy

Before commenting on class B (see below), we would like to conclude on patterns of use involving class C vessels by considering fire installations and kitchen contexts that might be connected with the use of amphoras and jugs (namely class C). At Phaistos itself, fireplaces have not been reported and have possibly escaped excavators' attention. Photographic documentation shows dubious evidence of a built "pi-shaped" hearth (embedded in a late dividing wall); nonetheless, a level of ceramic sherds associated with charcoal is mentioned in the excavators' notebook in relation to the area occupied by rooms 5–6, namely the main hall of the LM IIIC dwelling layout; this evidence might be related to a dismantled fireplace.

Hearths are indeed attested in LM IIIC settlements, where central examples, identified on occasion exclusively on the basis of a few burnt patches, were used; however, they were hardly the objects of care or of investment of energy in building and were rarely well-structured over the floor level (Day *et al*. 2000, 116–117; Glowacki 2004, 129; Yasur-Landau 2006a, 237–238; Day *et al*. 2009, *passim*; Brogan and Barnard 2011; Day and Glowacki 2012, 137). Hearths provided with a bedding of potsherds or pebbles with a clayey coat over them do not seem to have been at home in the local tradition. The most convincing evidence comes from Khania, where such a freestanding hearth, circular or rectangular in shape and with potsherd and pebble bedding, is introduced in LM IIIB 1 and used well into IIIC (Hallager 2000, 127–129; 2003, 189–190; 2011, 263–264). For LM IIIC Cretan households, similar installations have been reported, in particular in association with main halls, and were possibly the focus of ceremonial activities (Yasur-Landau 2006a, 238; Day and Glowacki 2012, 94); a series of these hearths has been recently identified at LM IIIC Kastrokephala (Kanta and Kontopodi 2011, 132–133).

It is worth noting that at Kastrokephala, "foreign" components, such as Italian-related bronzes and HBW vessels, have been identified (Kanta and Kontopodi 2011; D'Agata *et al*. 2012, 310; Borgna 2013, 133), while Khania is the only site where HBW dependent on Italian prototypes was locally produced from as early as LM IIIB 1 (Hallager 2011, 371–372; D'Agata *et al*. 2012, 298–299). These observations might strengthen the view that potsherd hearths would have been an innovation in LM III Crete, possibly reflecting foreign influence that scholars have tended to relate to a Mycenaean presence (Hallager 2011, 264; Kanta and Kontopodi 2011, 133). The hypothesis is all the more attractive as the previous local cooking tradition seems to have been largely founded on outdoor kitchen equipment, built pi-shaped hearths and cooking sheds (Hayden 1990, 209, 213; Shaw 1990; 1996; Brogan and Keller 2011). At those sites considered to have been affected by Mainland influence during LM IIIA–B, the innovative aspects of architectural plans including halls with freestanding central hearths between two posts or columns do not, however, incorporate new building techniques for hearths. At both Malia-Quartier Nu and Sissi, the LM III mansions seem to be provided with simple fireplaces, neither monumental nor provided with foundations of potsherds (Driessen and Farnoux 1994, 62; Driessen 2011, 114; 121–123; Driessen *et al*. 2012, 70; 84; 89–90). At LM III Mochlos, several cook sheds have been reported together with cooking fires placed directly on the room floors (Soles 2008, 8; *cf*. Morrison in this volume). According to this evidence, hearths built over potsherd or pebble beddings, though representing a functional component potentially at home in many different cultural contexts (Papadopoulou and Prévost-Dermarkar 2007, 127–129), might mark origins foreign to Crete.

A quick survey suggests that even in Mainland Greece this kind of hearth came into widespread use only in Post-Palatial times, possibly starting from LH IIIB late (Tournavitou 1999); examples have been reported at Mainland regional centers such as Mycenae (French 2011, 33), Tiryns (Gercke and Hiesel 1971, 16, pls 15; 20, 2; Grossman and Schäfer 1975, 57, fig. 7, 3; Kilian 1988, 117), Argos (Daux 1968, 1036–1037, fig. 11), Korakou (Blegen 1921, 79–99), and Lefkandi (Evely 2006, 15–18, 27–28, 121–122, 305). At all these sites, cooking amphoras and jugs were common and possibly used with the same cooking procedure that has been argued for at Phaistos (Evely 2006, 207; *cf*. Martlew and Tzedakis 1999, *e.g*. 131 nos

112–113; 135 nos 120–121, Mycenae; Yasur-Landau 2006b, 54). Particularly intriguing is the evidence of Korakou, where Blegen reported the presence of special structures, such as flat stones, at the edge of the hearth for supporting cooking vessels (Blegen 1921, 88; 90; Tournavitou 1999, 835). At Korakou, where hearths are placed in the main rooms of important houses (House P: Blegen 1921, 85–89), a notable amount of HBW has been found; some sherds come from the same buildings where the potsherd hearths have been reported (Blegen 1921, Houses L, M, P; Rutter 1975, 19 nos 2–3; 22 no. 13). Large, elaborate buildings are also associated with this kind of hearth at Tiryns, a site where HBW is particularly well-attested and where Italian connections have largely been verified (Kilian 2007; above).

It is tempting to accept, as some scholars do, that built hearths with potsherd beddings had been imported to Crete from the Mainland together with cooking amphoras and the habit of placing vessels at the edge of the hearth during a span of time ranging from IIIB well into the Post-Palatial period. It is sensible to note, however, that in the meantime, toward the end of the Late Bronze Age, the whole package including kitchen amphoras and cooking practices, was at home throughout the Aegean as well as in the wider Mediterranean world, including Cyprus (Karageorghis 1998, 276–279; 2011, 22–23; Jung 2011a, 66–67) and the Levant. In these areas, Mycenaean cooking amphoras and even built hearths are supposed by several scholars to signal the arrival of Aegean people (Ben-Shlomo *et al*. 2008, 236; Yasur-Landau 2010; 2011; Bunimovitz 2011, 239–240; Ben-Shlomo 2011). Therefore, an influence from the Aegean area on Crete in the field of material culture related to cooking and domestic activities is likely, but the ultimate provenance of the innovative elements, and thus their broader direction of movement, are hard to identify.

From the Central Mediterranean, comparanda for both potsherd hearths and cooking patterns implying heating at the edge of a fireplace may be found in many settlements during the Late Bronze Age and even earlier (Moffa 2002, 47, with references; Borgna *et al*. in press), for example at several sites along the Adriatic coast (Cazzella and Recchia 2008a; 2008b; Recchia 2010, 84–87), in the Plain of Sybaris at Broglio di Trebisacce (A. Vanzetti pers. comm.), in the Aeolian Islands (Fig, 10.6; Levi *et al*. 2011, 165) and even in the northern Adriatic (Fig.10.7; Borgna *et al.* in press). Cooking by keeping vessels at the edge of the hearth may be inferred from both well-structured benches asymmetrically built at one side of the hearth (Fig. 10.7) and traces of burning on the vessel surfaces.

For this matter, the settlement of Pozzuolo del Friuli, in the cultural environment of the Late Bronze Age hill-forts of northeastern Italy, may be considered a case-study, as it includes a possible indoor kitchen dating to an early part of the Italian Late Bronze Age or "Bronzo Recente" (13th century; Cassola Guida *et al*. 2004). Beside a hearth characterized by the careful preparation of a bedding of potsherds and pebbles covered with a thick layer of clay, a group of vessels, found crushed on the floor, seems to have been used mainly for food processing (Fig. 10.8). Scorch marks confirm that some vessels were placed at the edge of the fireplace (Fig.10.9). The kitchen set seems to have been made up of ovoid jars with slightly restricted mouths and with lugs or vertical handles positioned high on the wall, as well as of conical handleless bowls. A fine cup with a high vertical handle, possibly used as a dipper, also suffered the effects of secondary burning, as intense blackening exclusively on the side opposite to the handle seems to suggest. The round-bottomed vessel was possibly placed as a lid on the mouth of a larger pot while cooking, a usage that would explain the particular traces of secondary burning (Fig. 10.10). As for technological features, the roughness of the outer walls of most vessels, which are irregularly smoothed and rarely burnished, probably in order to facilitate the conduction of heat, is notable (Rice 1987, 232, 237–238).

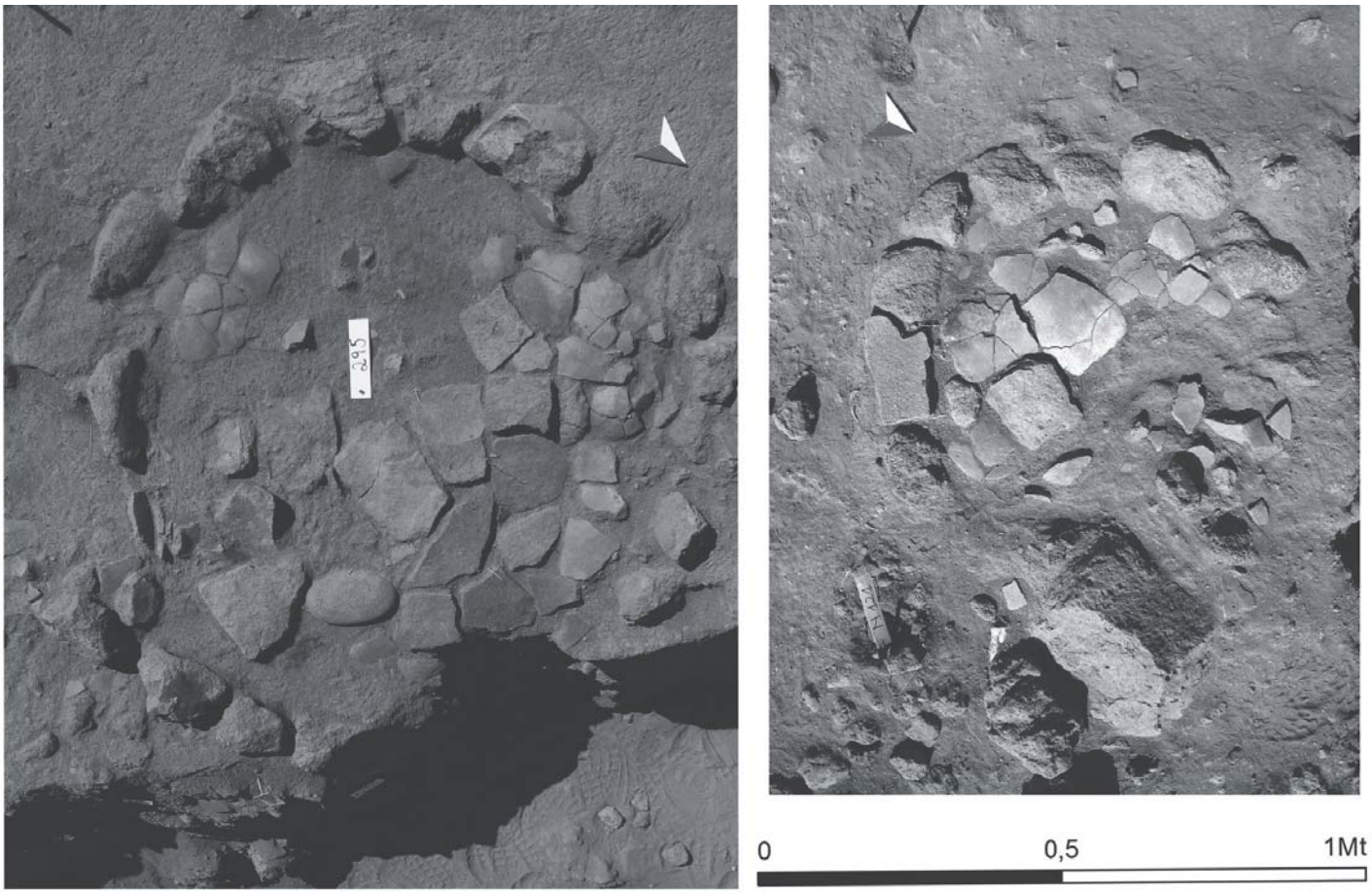

Figure 10.6. Potsherd hearths from the Eastern area of the Early/Middle Bronze Age settlement of Stromboli (Aeolian Islands). Left: the large one (1m) inside Hut 1 (Levi et al. *2011, 165); right: the small one "J" (60cm) located a little further east (Di Renzoni* et al. *2014, 106; Levi* et al. *2014)*

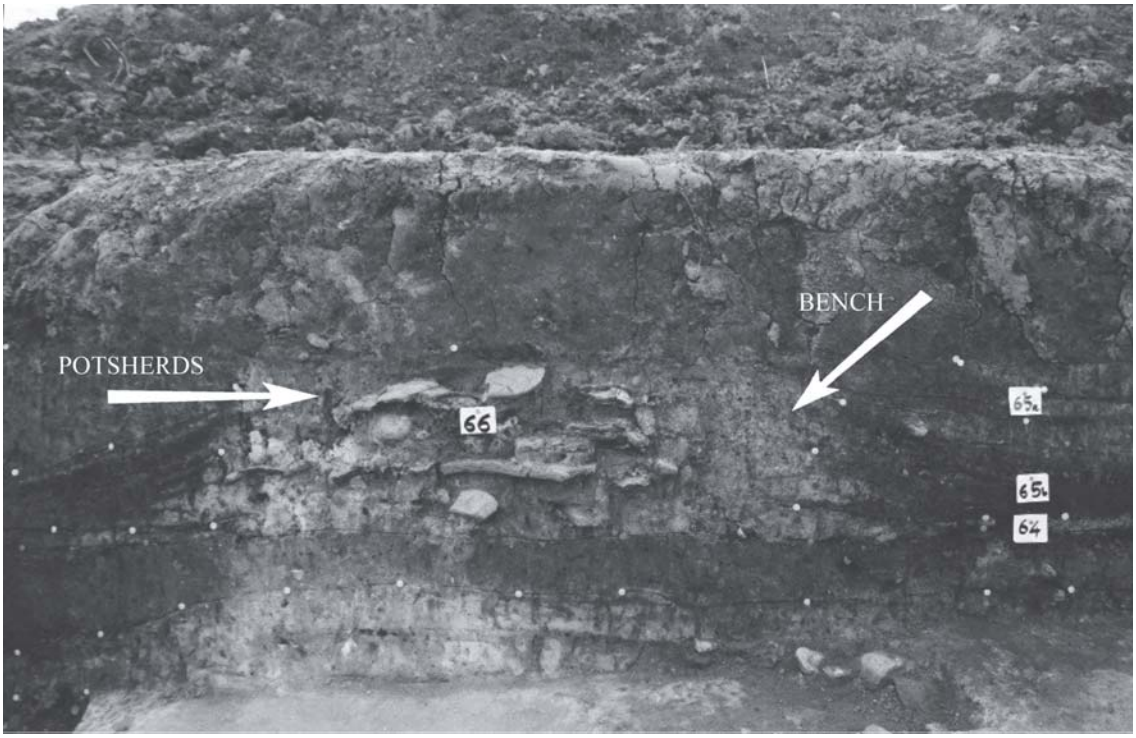

Figure 10.7. Potsherd hearth from the Late Bronze Age settlement of Ca' Baredi/Canale Anfora near Aquileia (Udine),

north-eastern Italy (excavation by the University of Udine and Soprintendenza per i Beni Archeologici del Friuli-Venezia Giulia, 2013). Photo by E. Borgna

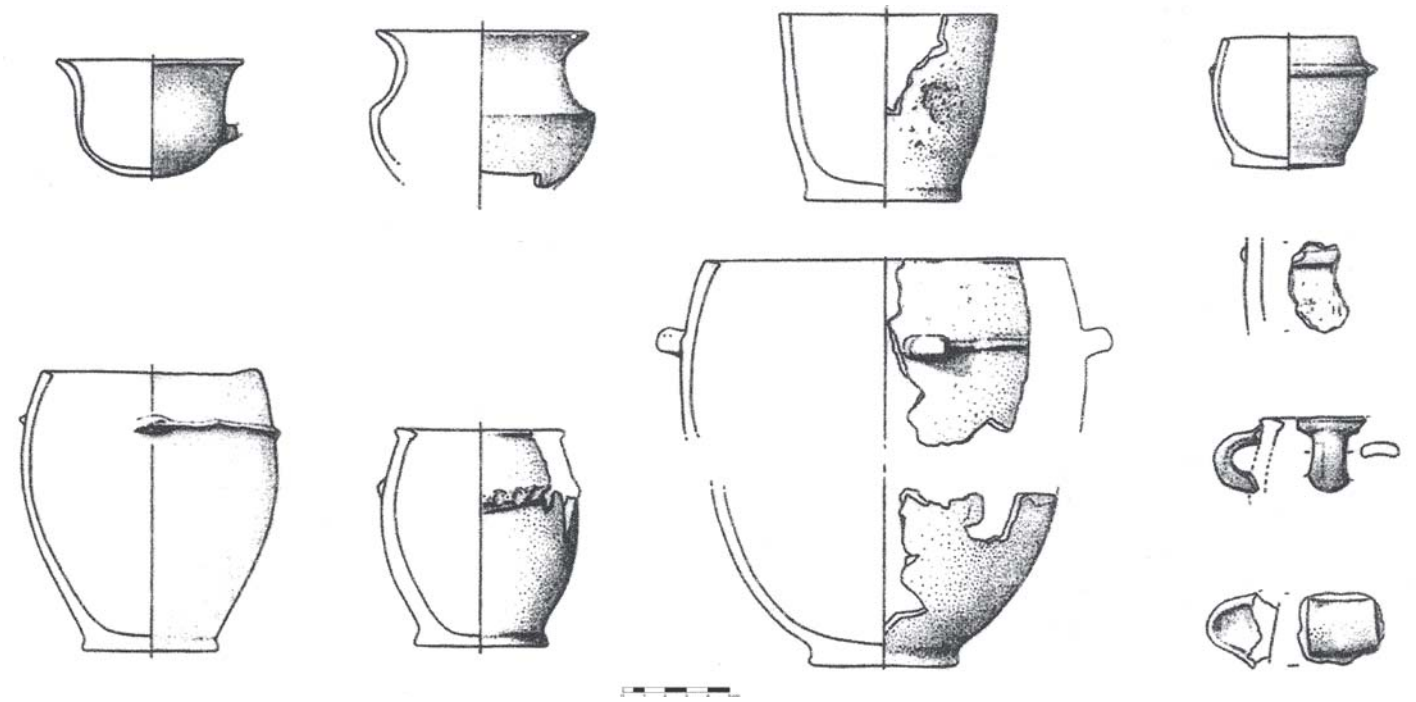

Figure 10.8. Vessels from the Late Bronze Age settlement of Pozzuolo del Friuli (Udine), North-Eastern Italy, after Cassola Guida et al. *2004, 79, fig. 1B1*

Figure 10.9. Fragments of a cooking jar from Pozzuolo del Friuli (Udine) (Aquileia, Museo Archeologico Nazionale). Photo by E. Borgna, courtesy of Soprintendenza per i Beni Archeologici del FriuliVenezia Giulia

Vessels and ovens, stone enclosures, sunken hearths and pit-ovens in Crete, Greece and Italy

Some evidence from Phaistos, albeit fragmentary, might point to a third cooking pattern, mostly associated with class B cooking pots; that is, the flat-based jars with small handles on the shoulders (Fig. 10.4; *cf.* Rethemiotakis 1997, 308, fig. 8; Hallager 2003, 240; 2000, pl. 45; Kanta and Kontopodi 2011, 143, fig. 10a, b), a morphological feature well-suited for vertical up-and-down movement. The most visible scorch marks involve the upper part of the vessel, including rim, neck, handle backs, and the body as far as its point of maximum diameter; the lower walls may appear completely unaffected by burning (see Skibo 2013, figs 3.22–3.24). The visual effect is exactly the opposite of what we saw in the cases of amphoras and jugs. We may tentatively relate this evidence to the preserved installation of room 5, consisting of a stone cupboard or enclosure (Fig. 10.11); the stone-lined structure (60×40cm in plan, with a height of 40cm), set against a wall, housed a large cooking jar with collared neck and vertical strap handles on the shoulders (B), the upper part of which protruded. Though we cannot rule out the possibility that the installation had been founded as a freestanding structure on the deepest floor, it certainly remained embedded in the floor level in the later phases; in order to be displaced, the jar then had to be lifted from the structure. The pot contained charred seeds, which left a black spot on the inner bottom, suggesting that food was probably cooked on the spot. The outer bottom shows a gray deposit and seems to have been subject to some degradation.

Figure 10.10. Cup from Pozzuolo del Friuli (Udine) (Aquileia, Museo Archeologico Nazionale). Photo by E. Borgna, courtesy of Soprintendenza per i Beni Archeologici del Friuli-Venezia Giulia

Figure 10.11. Stone enclosure from Phaistos, "Casa a ovest del Piazzale I" (Room 5). Archive SAIA, Athens

As is well-known, enclosures or bins made of upright slabs or clay had been widespread in Crete since Palatial times and were extremely common in LM III, when they were clearly associated with kitchen use (Shaw 1990, 238–239; 245; Day *et al*. 2000; Glowacki 2004, 129; Yasur-Landau 2006a, 238–239; Day and Glowacki 2012, 138–139). Scholars, however, prefer to consider them to be either storage installations or food processing areas in particular when no evidence of burning is recorded (Shaw 1990, 247).

The absence of any mention of ashes and charcoal might, however, be explained as a consequence of cleaning, an interpretation proposed for some similar structures at Kavousi-Vronda, where at least one stone enclosure has been found in association with remains of burning (Day *et al*. 2009). More puzzling is the apparent absence, at Phaistos, of any clay lining, an element that would prevent us from interpreting the structure as a true oven.

The association of the Phaistos installation with the cooking pot may find parallels at other LM IIIC sites such as Kavousi-Vronda (Day and Glowacki 2012, 65, 110, 139) and possibly Chamalevri (for a pit with cooking pots see Andreadaki-Vlasaki and Papadopoulou 2005, 351). May we infer that a kind of cooking procedure not far from "pit" or "earth ovens" was known in LM IIIC Crete, possibly in addition to that practiced in built ovens with a side opening and a domed covering (Hallager 2000, 129 with refs; Day *et al*. 2000; Glowacki 2004, 129–130; Yasur-Landau 2006a)?[3] We may observe that LM III Cretan built ovens are generally too small to hold a cooking pot (Shaw 1990, 244; *cf*. at Akrotiri, Birtacha 2008); some well-preserved contexts are associated with either simple stone slabs (Kavousi-Vronda: Day and Glowacki 2012, 64, 102) or cooking dishes (Karphi: Pendlebury and Money-Coutts 1940, 87). The two possibly

different structures – built ovens and pit-ovens – could permit therefore two different cooking procedures, possibly baking versus stewing.

Figure 10.12. Cooking in the Late Bronze Age settlement of Variano (Basiliano, Udine), northeastern Italy: a. the conical bowl is differently colored above and below the rope, photo by E.Borgna; b. the vessel in the pit during the excavation of the University of Udine, archive of the "Laboratorio di Preistoria e Protostoria", University of Udine

Figure 10.13. Jar from Pozzuolo del Friuli (Udine), northeastern Italy (Aquileia, Museo Archeologico Nazionale). Photo by E. Borgna, courtesy of Soprintendenza per i Beni Archeologici del FriuliVenezia Giulia.

Comparative evidence from Mainland Greece might include a kind of sunken hearth at Argos, where an amphora was found embedded in ashes within a pit lined with stone slabs (Daux 1969, 992–993, fig. 11; Darcque 2005, 174).[4] Mycenaean cooking pots intensively blackened exclusively on the upper body might point to a similar cooking procedure (*e.g*. Tzedakis and Martlew 1999, 185 no. 175, Thebes).

Other evidence from Late Bronze Age Italy is worth mentioning; at Variano, west of Udine, a site flourishing during the advanced Italian Late Bronze Age or "Bronzo Finale", *ca*. 11th century BC, in the abovementioned hill-forts environment of north-eastern Italy (Cassola Guida and Corazza 2000), two "pit-ovens" with inserted pots have been discovered in an open area in front of a dwelling during an excavation by Udine University (Fig. 10.12). A small, handleless conical vessel projected from a simple pit, with the floor level corresponding with the level marked by a relief rope. Faunal remains were found inside the vessel, which was perhaps covered with hot embers. Traces of blackening are visible exclusively inside the vessel (with a pattern similar to dry mode cooking: Skibo 2013, fig. 3.29), but they are missing on the outer walls. In contrast with the lower part of the vessel, which is light-colored, the surface above the rope is darker-colored, reddish, probably as a consequence of direct exposure to heat, which also caused visible surface degradation (Fig. 10.12).

Even in the abovementioned Pozzuolo kitchen at least one jar might have been used for cooking within a pit or a sunken hearth; signs of extremely rough smoothing affect only the lower part of the vessel (Figs 10.13, 10.8 bottom left), namely the part under the relief rope, while the upper surface is well-smoothed and burnished and shows some scorch marks. The vessel was possibly used inserted in the ground and remained embedded in hot embers, with the rim and the upper wall projecting. Roughness of the lower walls might have favored the contact of food with the source of heat created in the cooking hole or pit (see above). Blackening on the inside walls may be a further indication of this kind of use. Finally, the Phaistos room 5 installation may be compared to an Ausonian II ("Bronzo Finale") structure in Sicily at Milazzo, Viale dei Cipressi; this structure preserves a conical vessel inside a pit made of large upright stones (Levi *et al*. 2009, 80, fig. 20).

Final remarks

The evidence collected at Phaistos and other LM IIIC sites seems to diverge slightly from the previous Minoan kitchen, mostly founded on outdoor cooking activities and on indoor practices that exploited "pi-shaped" hearths and possibly also built ovens with box-shaped, well-insulated chambers. The adoption of a wider Aegean perspective including the analysis of Mainland contexts only partially and ambiguously helps to explain this transformation. It seems essential to consider a wider world including the Aegean "peripheries," with particular reference to the Central Mediterranean.

In the Post-Palatial period, the repertoire of Cretan cooking pots shows substantial continuity with the past, but the widespread diffusion of some shapes, such as amphoras and jugs, may point to the adoption of new functional patterns. Moreover, the occurrence of alternative cooking patterns, attested by freestanding built hearths associated with amphoras and jugs and by wall-enclosures or pits occasionally used as ovens or sunken hearths, might be dependent on the impact of a new international language particularly relevant to the domestic social domain. That means that the Mediterranean koiné of the 13th–12th centuries was not fueled exclusively by elite patterns in selected spheres of exchange including bronze goods; the concept of a *koiné* may be applied also to the realm of domestic life. Intense mobility at the level of households, as well as individual relationships, including possibly intermarriages and various intercultural, even asymmetrical, bonds – not excluding slavery and other forms of dependency – resulted in the sharing of everyday behaviors, which eventually resulted in the formation of communities based on the integration of practices derived from multiple cultural sources.

Notes

1 We would like to thank Julie Hruby and Debra Trusty for inviting us to participate in the Chicago session on cooking pots; they gave us the opportunity to learn a lot from a very stimulating and fruitful colloquium. Our participation was possible thanks to a generous grant from the AIA. We are particularly grateful to the referees (N. D. Abel, E. Gorogianni and J. Hruby) for improving our text with invaluable suggestions; we are indebted also to Reinhard Jung for comments and relevant indications; we remain, however, solely responsible for any errors or misunderstandings that may remain.

2 The particular tripartite foot with rolled-in outwards lower end from Scoglio del Tonno (Jones *et al*. 2014, 319, fig. 4.60, ST84) points to a possible reconstruction of the vessel more as an incense-burner/brazier than as a true cooking pot, as a few Rhodian parallels seem to suggest (Furumark 1992, pl. 172 FS 316; see, also for the reference to Scoglio del Tonno, Benzi 1992, 161–162; Karantzali 2001, 48–49, fig. 38, pl. 37); we are grateful to Reinhard Jung for drawing our attention to such parallels.

3 A hole with ashes and bones was found at Kavousi-Vronda: Day and Glowacki 2012, 124; for earlier evidence see Kopaka 1989, 23–26; for cooking holes at LM III Mochlos see Morrison in this volume.

4 *Cf*. Hiesel 1990, 70–71 for IIIB/C Katarraktis/Drakotrypa in Achaea; see also Blegen 1921, 87 for III C Korakou; Coulson 1983, 27–29 for Dark Age Nichoria, Unit IV-1; *cf*. possibly also Tournavitou 1995, 11–12, Mycenae-West House; for cooking by placing vessels in a pit filled with hot ashes or embers see, in the Eastern Mediterranean, Ben-Shlomo *et al*. 2008, 236–237, fig. 9.

11

Cooking vessels from Late Bronze Age Cyprus: Local traditions, western and eastern innovations

Reinhard Jung
with a contribution by Hans Mommsen

Introduction[1]

The seminal publication series of the Swedish Cyprus Expedition (SCE) laid the foundations for pottery studies on Cyprus. However, kitchen ceramics were not in the focus of that large project. Paul Åström in his SCE volume on the Late Cypriot Bronze Age did not provide a separate typology for cooking pots and did not illustrate any cooking vessels. Regarding cooking pot fabrics, he included them under "coarse ware" (Åström 1972, 266 n. 2), which reflects the fact that cooking pot fabrics do appear in other functional categories of pottery vessels.

The procedure was no different from the one adopted in the final publications of major excavations on the island. In the case of Enkomi, for instance, Porphyrios Dikaios eventually decided to leave out an already written chapter on the hand- and wheelmade plain wares by Angheliki Pieridou from his final publication ("in view of the enormous quantity of material dealt with, I decided, much to my regret, to omit that part of the text," he wrote; Dikaios 1969/1971, 825 n. 687). Such a treatment of unpainted pottery classes (and especially of the coarse wares) was in fact common practice all over the Eastern Mediterranean for a long time. In more recent years, Bronze Age cooking pots on Cyprus have attracted more interest from the scholarly community (*e.g.* papers in Karageorghis and Kouka 2011; Spagnoli 2010).

The present article focuses on the Cypriot Late Bronze Age, because a remarkable change in the production and use of cooking vessels occurred at the transition from LC IIC to LC IIIA at the start of the 12th century BC (for synchronisms with the Aegean see Table 11.1). At many sites on the island, Mycenaean-type cooking pots replaced the traditional Cypriot cooking vessels, but we can also observe some clear regional variability (Fig 11.1).

A painted Mycenaean fineware pot may be imported, or it may inspire local fineware pottery production, as the decoration and the fabric qualities may provoke a wide spectrum of uses and evoke symbolic connotations that may differ considerably from those in the Greek production region of the pot (*cf.* Jung 2015 with bibliography). A foreign-type cooking pot with technical-functional parameters different from those of the Cypriot ones is an issue that warrants another interpretation. The special importance of cooking pots and culinary habits for interpreting trans-cultural contacts has become clear in Aegean Bronze Age research since the debate on changes in the Late Minoan cooking pot repertory, a debate during which a wide array of ethnographic cases has been discussed (see *e.g.* Borgna 1997; see also Borgna and Levi in the present volume). In the present paper, a typological as well as technological study including statistic data and chemical analyses by NAA (H. Mommsen, Bonn) serves to describe the abovementioned changes to Cypriot cooking vessels in detail and to form a basis for historical interpretation. Rather than proposing an overarching interpretative model, this paper will proceed site by site and discuss the different possibilities of interpretation of kitchen ceramics within the framework of other archaeological evidence available for the different sites.

Table 11.1. Cypriot – Aegean synchronisms

Aegean	*Cyprus*
LH IIIB Developed	LC IIC
LH IIIB Final	
LH IIIC Early 1	
LH IIIC Early 2	LC IIIA
LH IIIC Developed	
LH IIIC Advanced	
LH IIIC Late	LC IIIB
Submycenaean	

(based on Mountjoy 2005; 2007; Jung 2011)

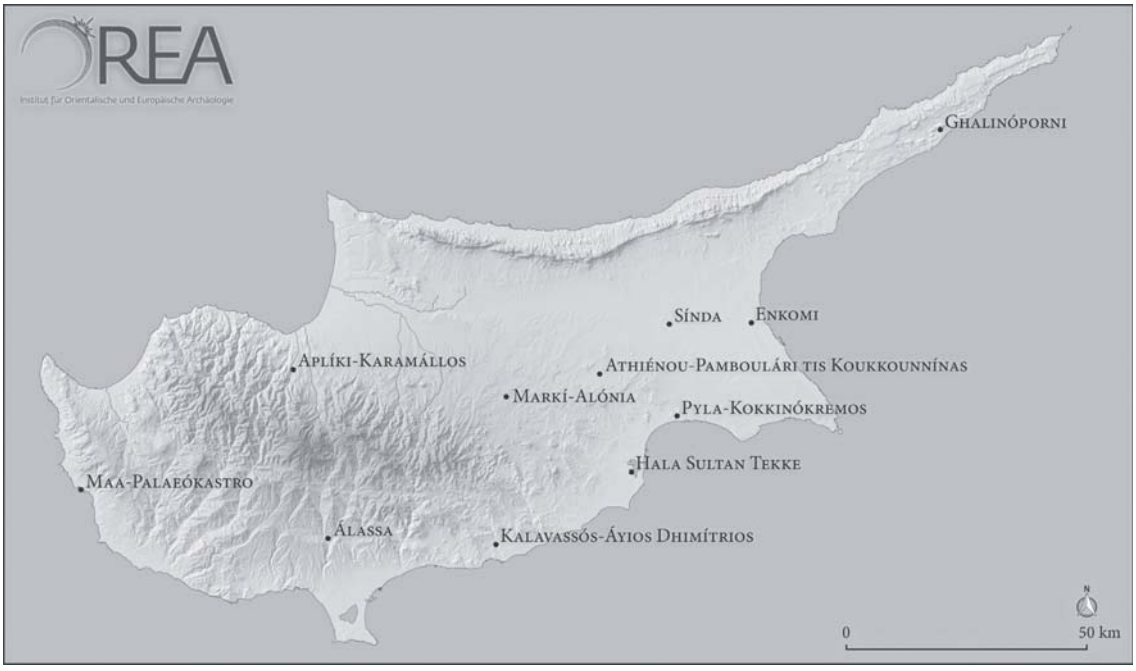

Figure 11.1. Map with sites discussed in the text. Cartography M. Börner

Cooking pots of Cypriot tradition (LC I–IIC)

While cooking pots of the early Late Cypriot (henceforth LC) phases are difficult to treat due to the scarcity of publications for LC I (see Crewe 2007, 118–119 for Enkomi), vessels from LC II contexts are better known. Cooking pots of these two periods share some basic characteristics (*cf*. also Russell 1989, 6; Jung 2011a, 58):

- They are always handmade and have wet-smoothed surfaces.
- Their fabric is coarse with a large number of inclusions and is fired very hard.
- They are wide-mouthed deep vessels with an ovoid to globular shape, most often with a rounded bottom.
- They have one or two handles positioned high on the body, but handle shapes and orientation vary to some degree. They may be vertical and attached to rim and shoulder or horizontal and placed on the shoulder.

Examples come from different parts of the island. One may cite a whole pot from Enkomi in the east, from building Level IIA, with two vertical handles from rim to shoulder, a height of 23.2cm, a rim diameter of 19.7–20.5cm and a capacity of 8.3 liters when filled to the base of the rim (Dikaios 1969/1971, 554, pls 60.31, 121.15; Fig. 11.2).[2] Two nearly complete pots from LC IIC Kalavassós-Áyios Dhimítrios in the center-south belong to the same type with two vertical handles. They have rim diameters of 16cm and 21.5cm and capacities of 3.4 liters and 8.2 liters (Russell 1989, 6–7; South *et al*. 1989, 140, fig. 10, K-AD 986 and K-AD 987). During LC II, people also used a kind of frying or baking tray measuring 20–*ca*. 40cm in diameter. Each tray has two horizontal basket handles on the rim and a shallow lower body that is separated by a carination from the short conical upper body (Dikaios 1969/1971, 560, 567, pls 60.28, 65.14, 121.7, 13; Spagnoli 2010, 36, 300–301, pls 103.1109–1112, 318–319, pl. 112.1195; Karageorghis and Georgiou 2014, 127, pl. 5.73–74; *cf*. also here fig. 11.5 from Enkomi Level IIIA). The fabrics of these trays are the same as those of the deep cooking pots.

From what we know of LC I material culture, it seems that in the production of the basic LC II cooking pot shape, potters continued a much earlier tradition. This becomes clear when looking at a wide-mouthed cooking pot from Ghalinóporni, tomb 1 (Crewe 2009, 95, 106 fig. 8.62). It has all the morphological characteristics of the later LC II cooking pots but belongs to an assemblage of Middle Cypriot III–Late Cypriot IA date (Fig. 11.3). Its height is 23.1cm, its maximum diameter 24.9cm (Crewe 2009, 111 no. 62; *cf*. also a fragmentary specimen from Enkomi Level I: Dikaios 1969/1971, pl. 121.4).

The Cypriot cooking pot tradition reaches further back toward the beginning of the Bronze Age on the island, as the continuous stratigraphy of the settlement at Markí-Alónia at its center demonstrates. This settlement covers the phases Early Cypriot III through Middle Cypriot I/II. Cooking pots from Markí-Alónia are handmade, wide-necked, and often round-bottomed, although examples with a slightly flattened bottom, with a central knob, or even with three short legs, complete the spectrum. These EC–MC cooking pots have a higher neck than most LC ones. They are often equipped with two handles (sometimes of different sizes), but jugs with one handle are also attested (Frankel and Webb 1996, 166–171 fig. 7.23; 2006, fig. 4.46–4.47). One can describe a typological development from EC to LC II, but it appears as a continuous process of alteration rather than a series of abrupt innovations. At Markí it is also possible to reconstruct the use of the earliest Bronze Age cooking pot types in Cyprus. Either soot traces on the exterior are confined to the lower and mid-body and absent on the base, thus indicating a position directly in or over the fire (soot on the base would have been oxidized during cooking because of the high temperature at this spot), or they appear all over the exterior and can be interpreted in terms of suspending the pot above the fire, but in a higher position. The

excavators reached these conclusions by comparing the evidence of the Markí cooking pots with various ethnographic case studies (Frankel and Webb 1996, 169; *cf*. also Skibo 1992, 148–173; 2013, 84–93 with more ethnographic evidence leading to similar conclusions). In fact, the excavated hearths provide evidence for built-in pot supports or alternatively portable stands of the same shape (so-called hobs), on which cooking pots could sit. In addition, the secondary use of vessel parts to support cooking pots is attested (Frankel and Webb 2006, 14–18 pls 6,g, 7, 9).

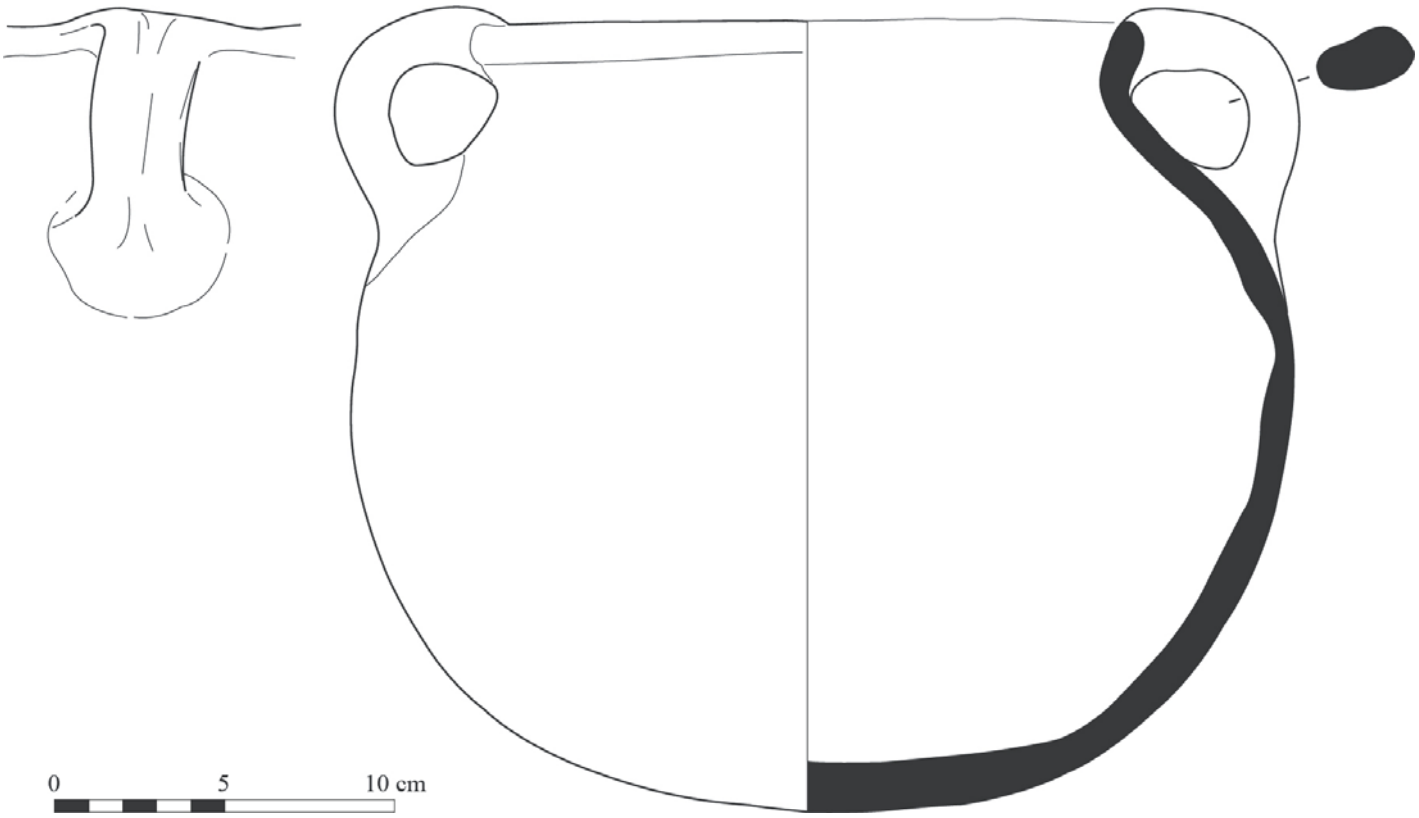

Figure 11.2. Handmade cooking pot from Enkomi Level IIA, Enk. 1821. Drawing by D. Knauseder, digitization by R. Yassine. Scale 1:3

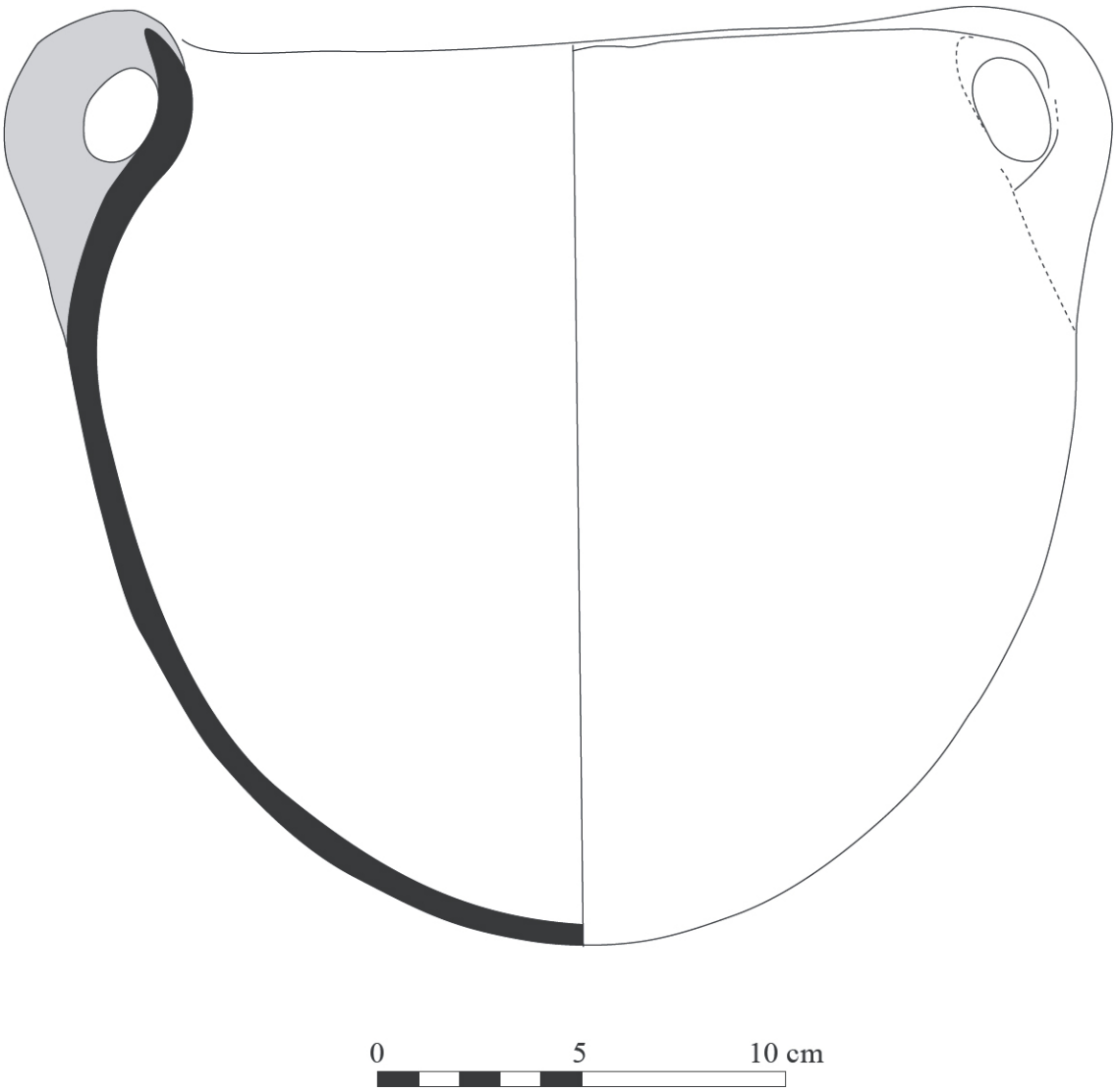

Figure 11.3. Handmade cooking pot from Ghalinóporni, tomb 1 (after Crewe 2009, 106 fig. 8,62). Scale 1:3

By LC IIB and IIC, in the late 14th and during the 13th century BC, a basic morphological characteristic of cooking pots of different types was the rounded base, inherited from the earlier Bronze Age periods. However, the sophisticated hearth installations and hobs had gone out of use. The soot marks on the abovementioned complete cooking pot from Enkomi IIA (Fig. 11.2) are similar to those on some of the cooking pots from Markí-Alónia. They run all around the lower half of the vessel, but are absent in the center of the base (Fig. 11.4).

As suggested for the EC/MC pots, these soot marks attest to a placement in central contact with the fire. In this case, however, we have to suppose a position on top of the charcoal, for at Enkomi Level IIA we only know of a very simple fireplace in Room 54, a burnt place on the floor with stones that may have helped to keep a pot in position (Dikaios 1969/1971, 42, pl. 249). This fireplace is similar to the earlier hearths of Level IB, which were places of burning or shallow pits filled with ashes (Dikaios 1969/1971, 21–22, 25, 29, pls 245, 248). Once, the excavator mentions a fragmentary "slab of baked clay (L. 0.35, W. 0.18 m.)" in one of the rooms of Level IIA and states that it "was evidently the hearth of which the original shape was possibly circular" (Dikaios 1969/1971, 41, pl. 249). This hypothetical installation is an exception, but it differs also from the later hearth platforms of Enkomi Level IIIA that were larger and made up of different layers (see below).

The complete cooking pot from Room 13A of Level IIA (Fig. 11.2) was found embedded in the floor and filled with animal bones, which Dikaios interpreted in terms of a foundation rite (Dikaios 1969/1971, 38, pl. 249). Due to its contents, this secondary use nevertheless alludes to the original function of that pot burnt by its use on the hearth fire.

Figure 11.4. Handmade cooking pot from Enkomi, Level IIA, Enk. 1821. Photo by R. Jung

In the settlement of Enkomi Level IIB, in the late 13th century BC (Jung 2011a, 61–63: synchronized with LH IIIB Developed–LH IIIC Early 1, see here Table 11.1) the hearths remained simple fireplaces of 0.50m to *ca*. 0.80m diameter on the house floors without any architectural installation (Dikaios 1969/1971, 49–50, 165, pls 251, 271: Rooms 3A, 3B, and 32B in Quarter 1 West/Area III and Room 118 in Quarter 4 West/Area I – not including hearths from workshops).

Cooking pots of Mycenaean type (LC IIIA–IIIB)

Kitchen equipment changed profoundly after the destruction of the town of Level IIB and the building of the new town of Level IIIA. During a short transitional phase that can be stratigraphically related to the construction period of the new buildings, Cypriot cooking vessels were still in use. One complete handmade cooking pot with vertical handles was found on a floor, from which the foundation trench of a wall in the

building of Quarter 1 West was dug (Dikaios 1969/1971, 119, pl. 65.11, 254 [no. 1513 in Room 44]; Jung 2011a, 63, 79, fig. 1.5). A handmade baking tray ended up in a pit underneath the central hearth in Room 14 in Quarter 4 West (Fig. 11.5).[3]

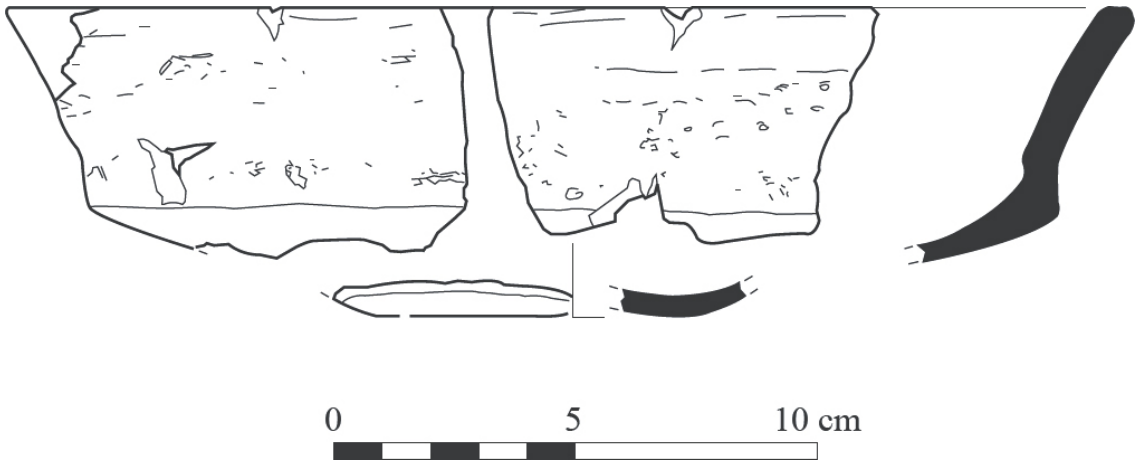

Figure 11.5. Handmade baking tray from Enkomi, Level IIIA, Enk. 1939/. Drawing by R. Jung, digitization by R. Yassine. Scale 1:3

Nevertheless, at the same time the population had already begun to use Mycenaean wheelmade cooking pots of Furumark Types (FT) 65 and 66 as well as other ceramic novelties such as new types of Mycenaean painted and unpainted fineware types (for finds from the same pit as the baking tray see Mountjoy 2007, 583, fig. 1.5–7; Jung 2009, 80, 84, 92, fig. 6.1). Thanks to Dikaios' careful documentation, we have good stratigraphic evidence for this transitional phase of plurality of cooking consumption habits during early Enkomi IIIA (Jung 2011a, 63–64). A new Mycenaean kitchen set prevailed and replaced the Cypriot cooking tradition. The basic types in all kinds of settlement contexts during LC IIIA were the Mycenaean cooking jug FT 65 and the Mycenaean cooking amphora FT 66 (Figs 11.6, 11.7a–b). By contrast, Mycenaean tripod cooking pots FT 320 were rarely used (Jung 2011a, 69, 81, fig. 4.7, 85, fig. 9.2; Fischer and Bürge 2014, 68, 82, fig. 29.10). The following technological features suggest that these cooking pots were produced on the fast wheel, just as were the FT 65 and 66 cooking pots in Greece: deep concentric rilling all the way down the interior wall, a central swirl (continuing the concentric rilling) on the interior bottom, and sometimes also an s-shaped crack across the interior bottom. In the absence of radiography and dedicated thin section studies, at present we have to refer to these macroscopic characteristics for the forming techniques used (Jung 2011a, 68, 85, fig. 9.5; *cf*. Crewe 2007, 97–98 for further discussions of those features with reference to other pottery classes at Enkomi).

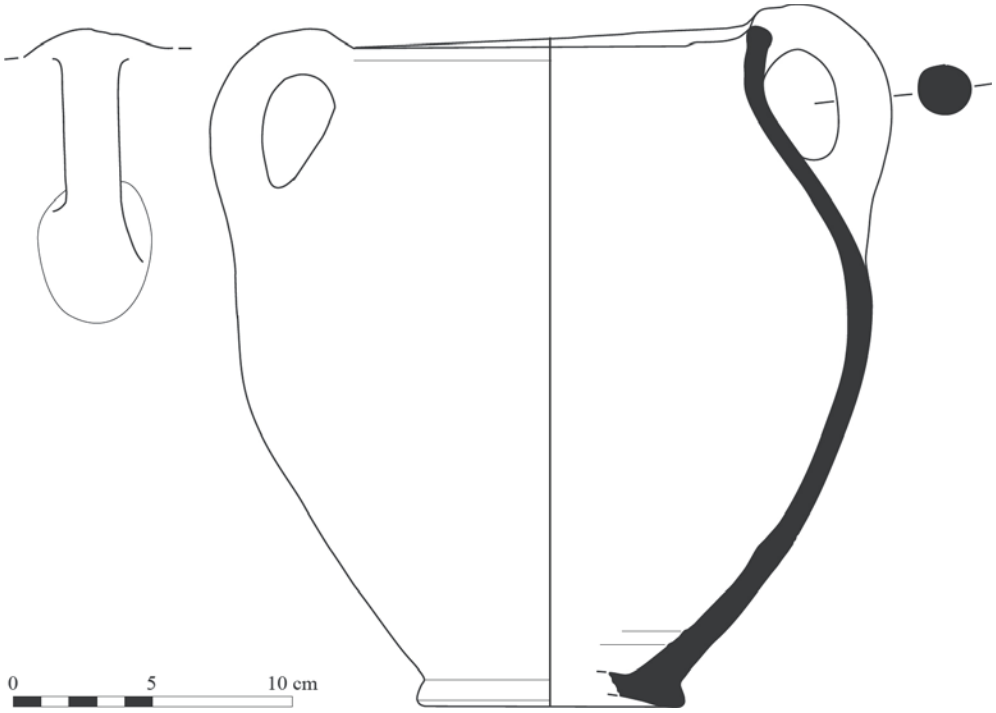

Figure 11.6. Wheelmade Mycenaean-type cooking amphora from Enkomi, Level IIIA, Enk. 1343/6.7. Drawing by R. Jung, digitization by R. Yassine. Scale 1:3

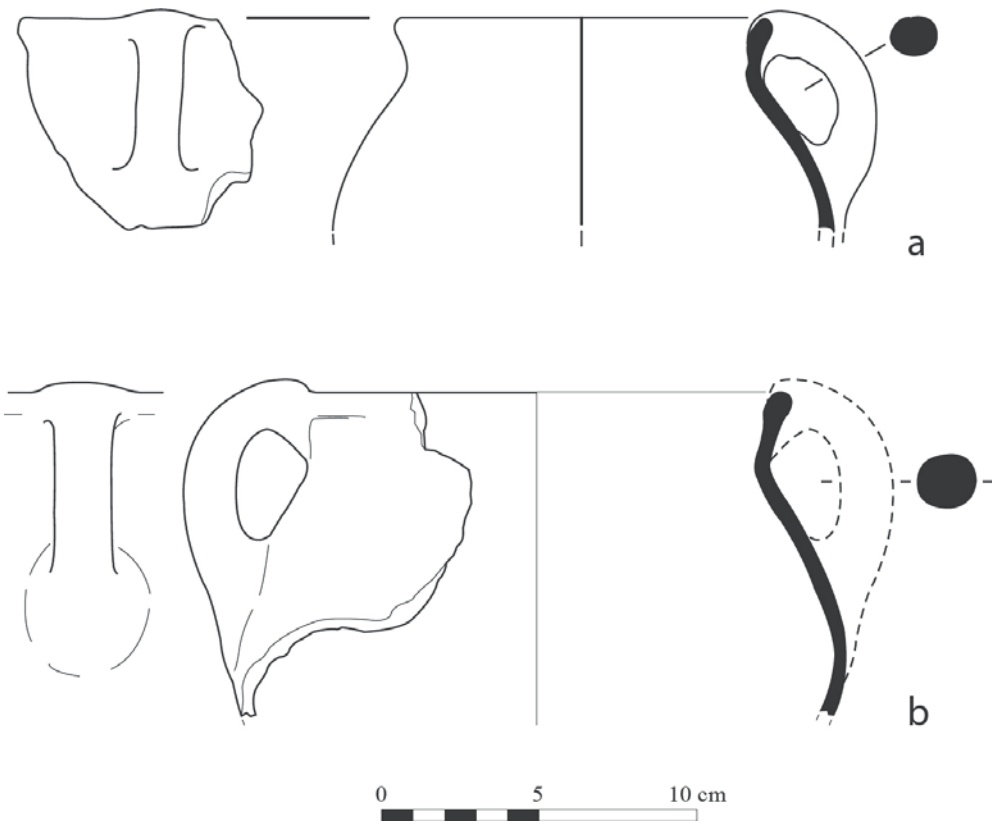

Figure 11.7. Wheelmade Mycenaean-type cooking pots from Enkomi, Level IIIA, Enk. 3769/24, Enk. 1343/. Drawings by R. Jung, digitization by R. Yassine. Scale 1:3

Figure 11.8. Wheelmade Mycenaean-type cooking amphora from Maa-Palaeókastro, Floor I, no. 350. Photo by R. Jung

The NAA conducted by H. Mommsen shows that the clay recipes used by the potters of the Mycenaean cooking pots during Enkomi Level IIIA did not correspond to those used by the potters of handmade cooking pots during the time of the preceding Level IIB (see p. 143–144). Thus, the typological break between the two cooking pot classes went hand in hand with a technological break as well. As the Mycenaean-type cooking pots do not contain finer or fewer inclusions than the handmade cooking pots (see p. 143), it does not seem that the new forming technique ultimately necessitated this change in the choice of clay beds and paste preparation. At least there is no positive hint favoring an exclusively technological explanation for the change in clay recipes.

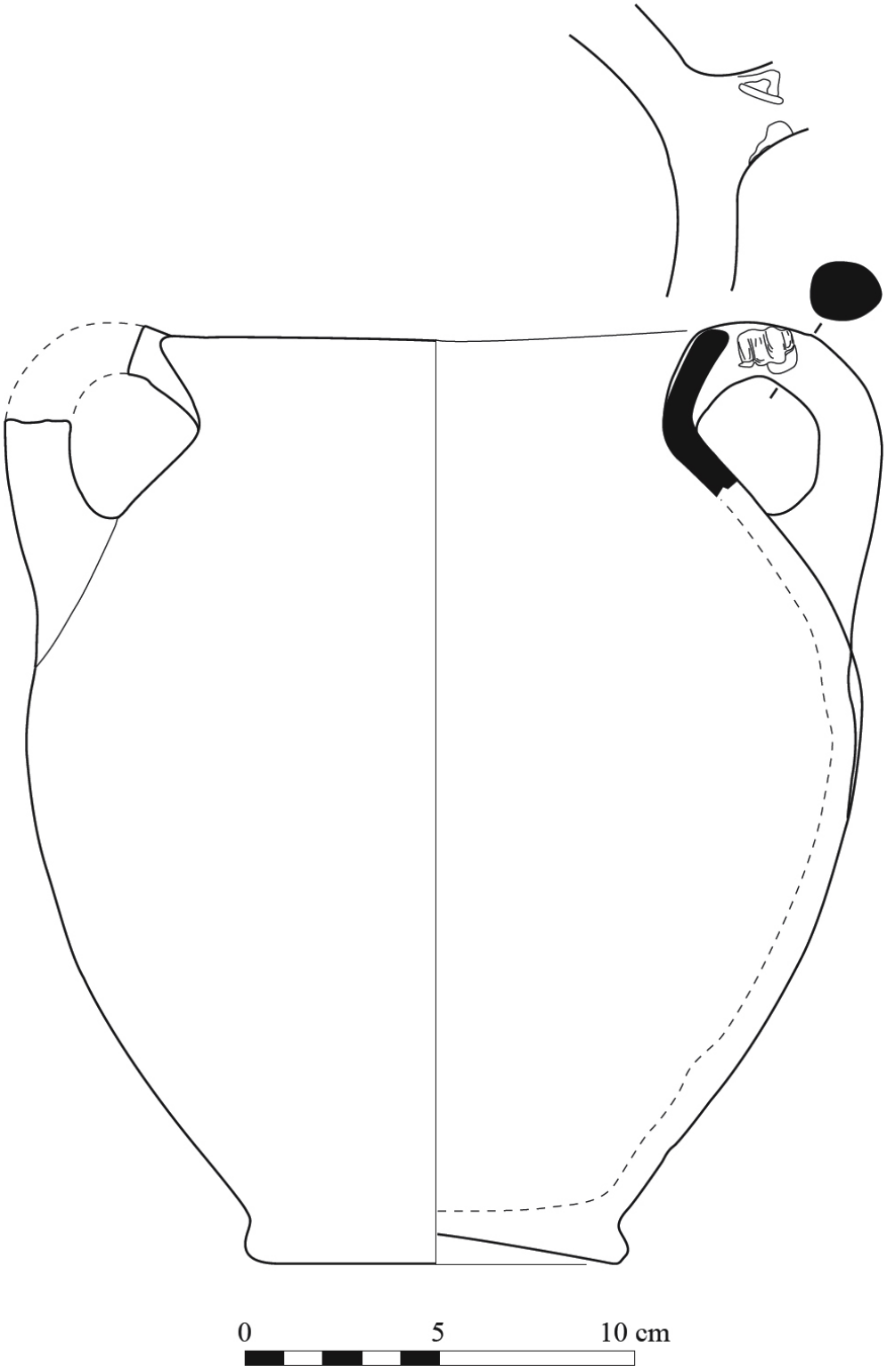

Figure 11.9. Wheelmade Mycenaean-type cooking amphora from Maa-Palaeókastro, Floor I, no. 350. Drawing by D. Knauseder, digitization by R. Yassine. Scale 1:3

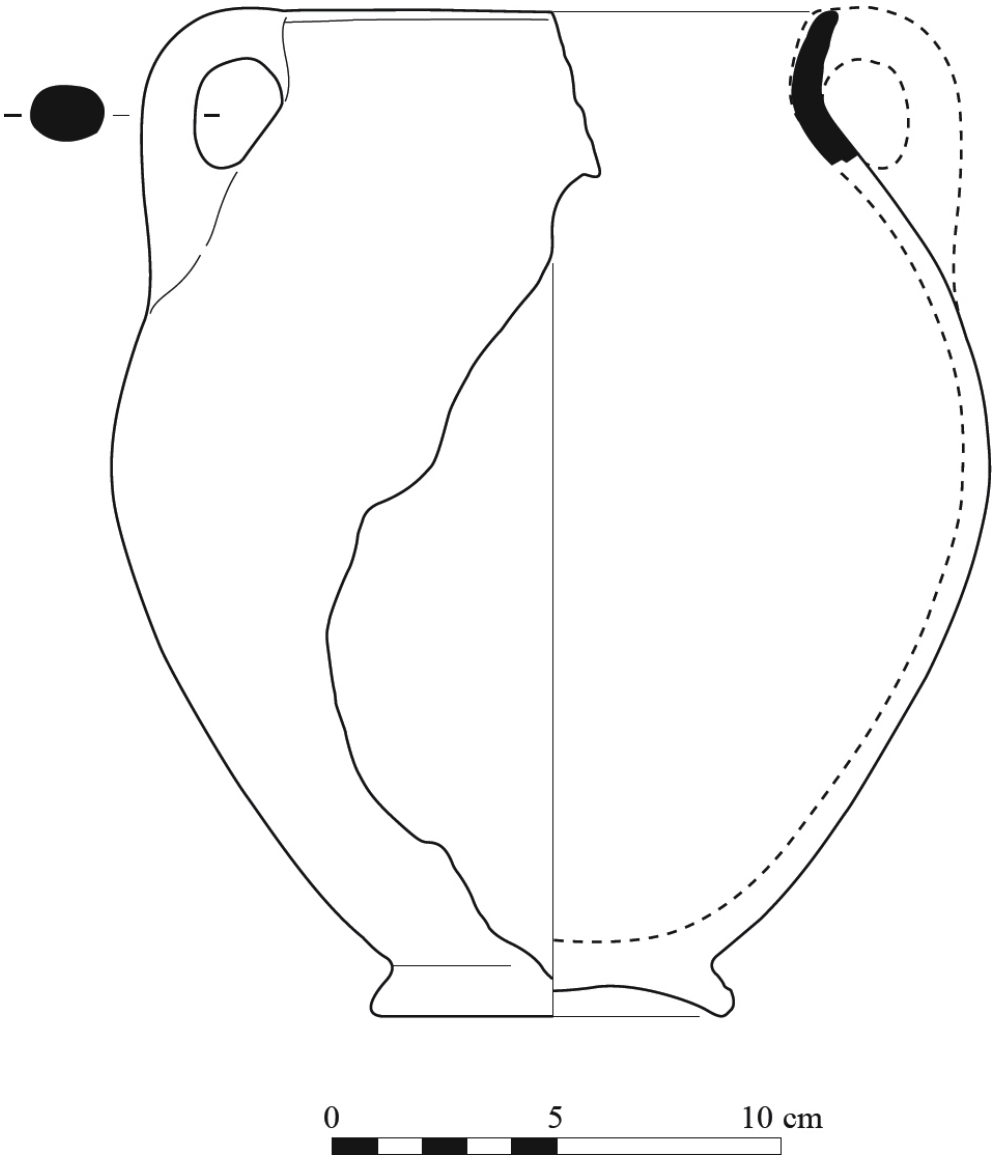

Figure 11.10. Wheelmade Mycenaean-type cooking amphora from Maa-Palaeókastro, Floor II, no. 336. Drawing by D. Knauseder, digitization by R. Yassine. Scale 1:3

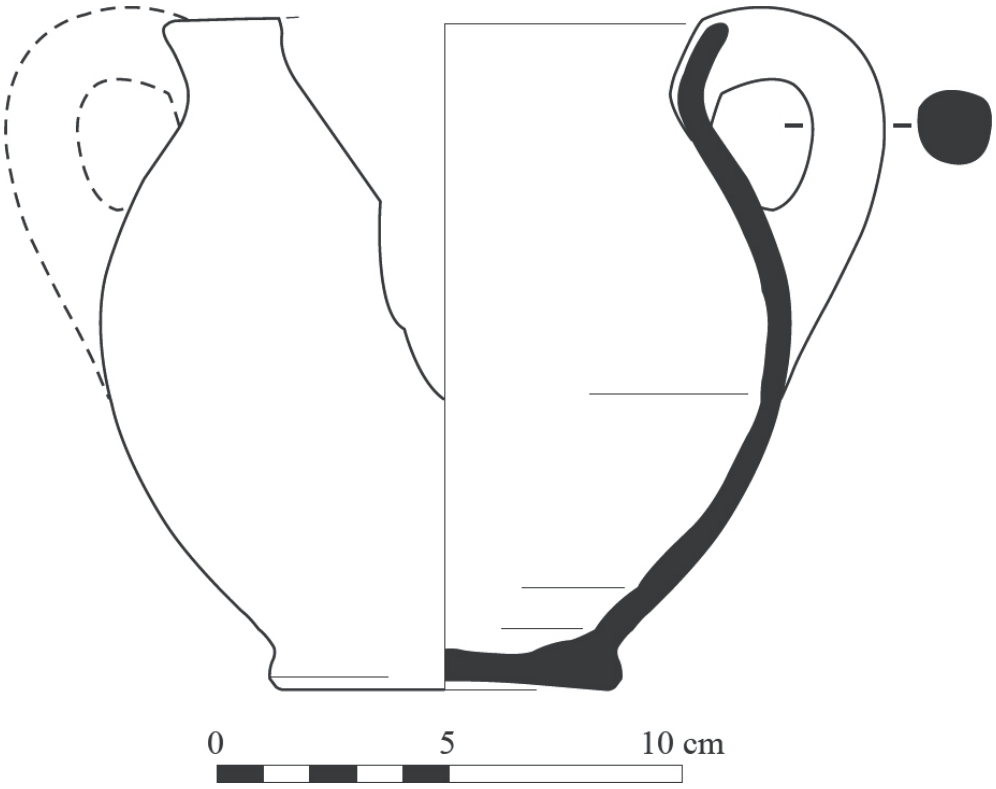

Figure 11.11. Wheelmade Mycenaean-type cooking pot from Maa-Palaeókastro, Floor II, no. 425. Drawing by R. Jung, digitization by R. Yassine. Scale 1:3

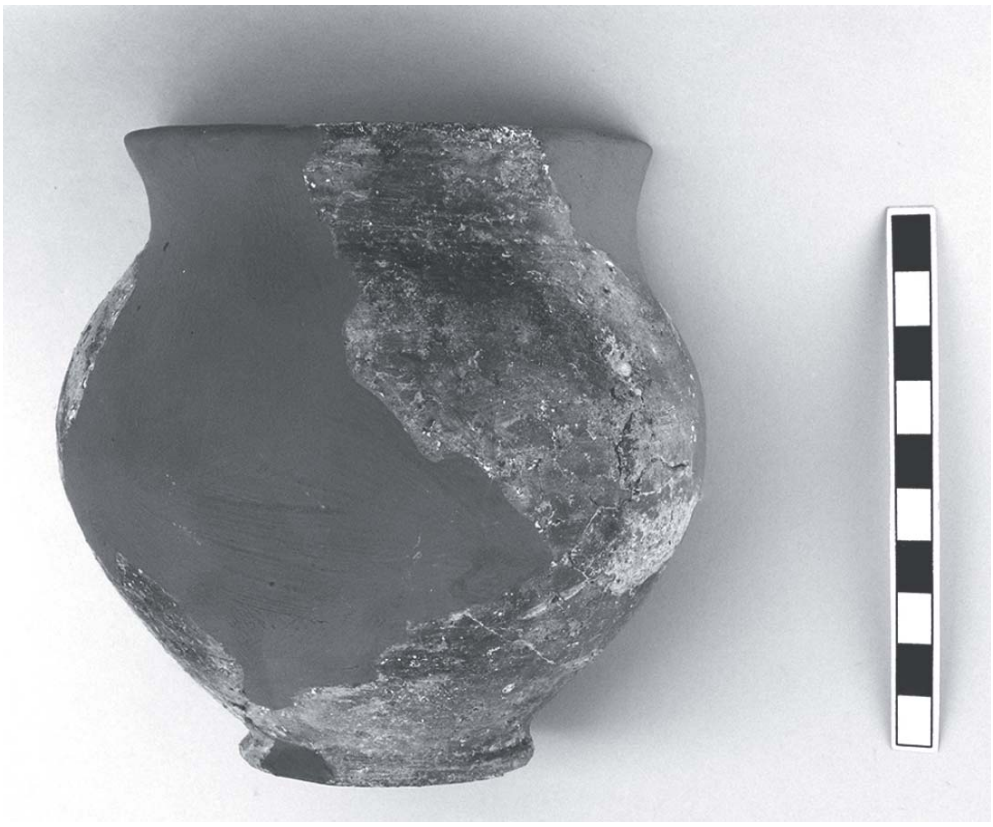

Figure 11.12. Wheelmade Mycenaean-type cooking pot from Maa-Palaeókastro, Floor II, no. 578. Photo by R. Jung

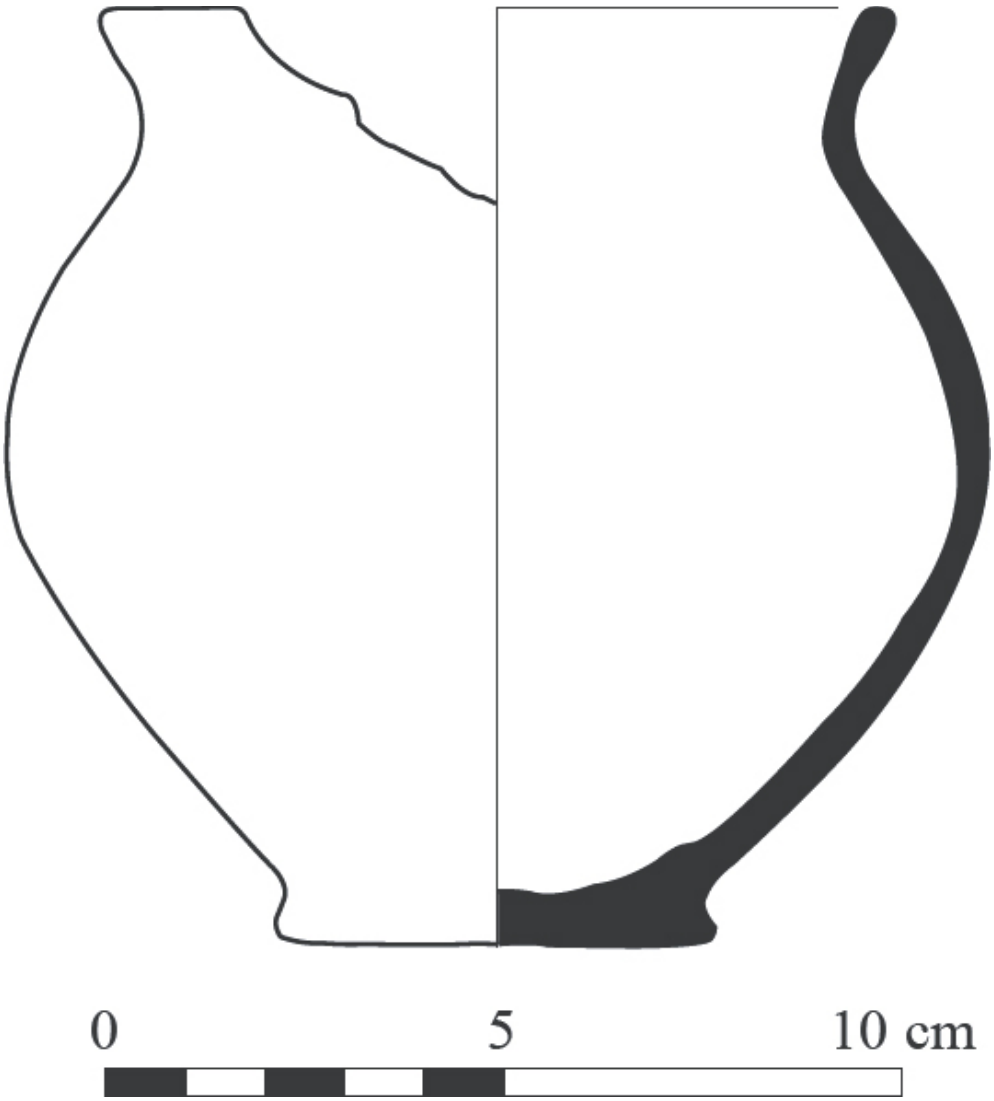

Figure 11.13. Wheelmade Mycenaean-type cooking pot from Maa-Palaeókastro, Floor II, no. 578. Drawing by R. Jung, digitalization by R. Yassine. Scale 1:3

The cooking pots of FT 65 and 66 at Enkomi had different proportions, with rim diameters typically between 11 and 18 cm (Jung 2011a, 61, 80, fig. 3) and smaller capacities than the preceding round-bottomed Cypriot cooking pots. A complete cooking amphora FT 66 from Enkomi could hold 5.1 liters when filled to the base of the rim (Fig. 11.6). Several restorable cooking pots FT 65–66 from Maa-Palaeókastro allow capacity calculation. They could hold 6.4 liters (FT 66), 4.4 liters (FT 66, Figs 11.8, 11.9), 4.0 liters (FT 66), 3.3 liters (Fig. 11.10), 3.2 liters, 1.3 liters (Fig 11.11), and 0.7 liters (Figs 11.12, 11.13) when filled in an analogous way. The morphological features of FT 65–66 from Cyprus show the following variability:

- The bodies are ovoid to rounded or bulgy.
- Rims are flaring or everted, either lipless or with a slightly thickened lip (with a rounded or slightly angular section, but not markedly hollowed).
- The bases are raised, either flat or concave underneath.
- The one or two vertical handles from rim to shoulder have an oval or circular section.

These flat-bottomed and high Mycenaean-type cooking pots must have been used in a distinctly different way

from the bulgy and round-bottomed Cypriot ones. This change in cooking pottery shape went hand in hand with the invention of new hearth constructions, on which these vessels came to be used.

The Enkomi evidence

We can follow the introduction of the new cooking facilities in the clear vertical stratigraphy of Enkomi that provides us with the master chronology to compare with other sites on the island. Two of the stratigraphically earliest hearths of Enkomi Level IIIA in Quarter 1 West were in use in Rooms 63 and 64 adjacent to the fortification wall. They were laid out right on top of the Level IIB destruction debris (Dikaios 1969/1971, 74, 118–119, pls 254, 261.3, 264.6).[4] The hearth in Room 63 is a massive, 0.22m thick "calcareous floor" measuring 1.60m in length (Dikaios 1969/1971, 118, pl. 21.3). The one in Room 64 was likewise of "concrete," but square with a side length of 1.50m (Dikaios 1969/1971, 119).

Other hearths of "concrete" are situated in Rooms 78 and 89A. The latter is a platform of 1.30×0.90m, 0.10m high (Dikaios 1969/1971, 112–113, pl. 19.4, 20.1; Karageorghis 1998, 277–278, fig. 1). The one in Room 78 is circular with a diameter of 1.30m and a height of 0.20m. Here, the "thick concrete floor" covers a sherd layer (Dikaios 1969/1971, 109, pl. 20.4). In Room 77, a large hall, we find a rather elaborate hearth platform, 0.10m high and built of standstone slabs. It measures 1.0×0.50m. The stone slabs were covered with "a thin layer of red mud mortar" (Dikaios 1969/1971, 106–107, pls 254–255; Karageorghis 1998, 277–278, fig. 1). By contrast, the hearth constructions in Room 32 are rather simple. One is rectangular, bounded with two stone blocks at the sides and with a width of 0.50m. It is made "at floor level but with a special floor laid on the floor of the court". The second one is in an angle of the room is of simple mud mortar and also measures 0.50m in width (Dikaios 1969/1971, 98, pls 15.3, 254).

The so-called Ashlar Building in Quarter 4 West was equipped with central hearths in three rooms, among which is one of the most elaborate hearths that we know from the town (Fig. 11.14). Dikaios described the abovementioned hearth in Room 14 as follows: "The hearth was a square platform 5–10 cms. in height and 1.20 m on a side, built of a lower layer of red mud mortar, a middle layer of broken pottery and an upper layer of concrete, the surface of which was heavily burnt" (1969/71, 175, pls 31.1, 273–274; for the pottery of the sherd layer see Mountjoy 2007, 583–585, fig. 2; Jung 2009, 80, 84, 90, pl. 3.6). The hearth in Room 46 is a low platform made up of a layer of sherds "covered with a concrete floor with traces of fire" (Dikaios 1969/1971, 186, pls 33.5, 273–274), whereas the one in Room 45 is simpler in construction. It is just a 0.10–0.15m high platform of 1.25×0.90m, built of a lower layer of red-brown mud mortar and a top layer of finer mud, which covers the upper surface and the sides (Dikaios 1969/1971, 183, pls 273–274).

To sum up, in the 12th century BC the inhabitants of Enkomi Level IIIA (LC IIIA, synchronized with LH IIIC Early 2 and IIIC Developed by Mountjoy 2007, see Table 11.1) constructed hearth platforms employing a variety of materials, and these hearths were considerably more elaborate than the simple fireplaces of the preceding Level IIB. No matter how different their individual constructions may have been, they evidently served a common purpose. The sherd beds, the thick lime plaster, and even the different mud layers would help to preserve the heat of the fire and to emit it slowly to the cooking pot bases.[5] We find the models for these new hearth constructions in Greece, *e.g*. at Tiryns and Dhimíni during the late Palace period and at Lefkandí in the early Post-Palatial period (Karageorghis and Demas 1988, 60–61, 263; Karageorghis 1998, 277–278; Jung 2011a, 67). The flat bases of the Mycenaean cooking pots FT 65 (jug) and FT 66 (amphora) were functionally suited to stand on top of these platforms and next to the fire (Popham and Milburn 1971, 336–337, fig. 2.5; Killebrew 1999, 107; Lis 2006, 18; Stockhammer 2007, 319–321; Ben Shlomo *et al*. 2008, 235–236). We can better understand this function by means of a contemporary functional analogy.

In southern Calabria, Italy, traditional ceramic cooking pots called *pignata* (plural *pignate*) are

morphologically very close to the Mycenaean cooking pots FT 65–66 (Fig. 11.15). The basic differences from the Bronze Age pots consist of the glazed interior walls and the position of the two vertical handles. The latter are placed on the same side of the vessel at an angle of 80° from each other. *Pignate* exist in different sizes, the largest ones measuring *ca*. 21cm in height with a rim diameter of *ca*. 10.5cm (Fig. 11.15 shows two smaller specimens). For cooking, one sets them right next to a fire lit on a stone or (more recently) concrete ledge, such as in front of an oven. Thus, they acquire characteristic soot marks on one side, the side opposite the handles, from the base up to the rim. Most often a *pignata* is used to cook beans or chickpeas. According to information gathered at Caria and Marina di Zambrone (both in the Province of Vibo Valentia) by interviews and observing cooks at work (though not in the framework of an experimental archaeology project), these dishes need about four hours of slow cooking close to the coals. It is necessary to add water several times, but stirring the food is not obligatory. However, one needs to take care that the beans or chickpeas do not boil over; otherwise, they lose their flavor. Some cooks would grasp each of the two vertical handles with one hand and perform an up- and downward shaking movement in order to jumble the contents of the pot. Usually, but not always, lids are placed onto the pots (Fig. 11.15: a traditional ceramic lid on the left, the lid of a can serving as a substitute to the right).

We find the same kind of soot marks as those on the *pignate* on a series of better preserved Mycenaean-type cooking pots from Maa-Palaeókastro (Figs 11.8, 11.12). These confirm the kind of use deduced from the contemporary analogy. Furthermore, in both settlement phases at Maa-Palaeókastro, the earlier Floor II and the later Floor I, there are hearth platforms with underlying sherds or pebbles corresponding with the hearth platforms of contemporaneous Enkomi Level IIIA (Karageorghis and Demas 1988, 60–61, 263; Karageorghis 1998, 277–279, figs 1–2; Jung 2011a, 66–67).

The Mycenaean-inspired method of cooking in flat-bottomed jugs and amphorae on hearth platforms remained in use for approximately a hundred years at Enkomi, where the latest context is a hearth deposit in Room 12 of Quarter 4 West. It consists of a vessel set that was being used on and near a hearth when the town was destroyed in LC IIIB, at the end of the habitation period of Level IIIB, contemporaneous with the Submycenaean phase in Greece (Dikaios 1969/1971, 200, pls 105, 106.1–3, 124.1–19; Mountjoy 2005, 165, table 7; see here Table 11.1). That assemblage comprises various cooking pots and a complete set of painted vessels, including deep bowls, cups, an amphoroid krater, a neck-handled amphora and a large jug (Mountjoy 2005, 170, 173, 174, 177, 189–191, figs 17.1, 17.2, 17.4, 19.15–17, 20.20, 22.33–36, 31–32.74, 33.76). The hearth around which they were found is a very large circular platform, measuring 1.70m in diameter and 0.10m in height (Dikaios 1969/1971, 200, 276–277, pl. 41.2). Like earlier hearths in Level IIIA, it consists of a lower layer of sherds plastered over with mud mortar, but it is a more complex construction than the earlier examples. On the earlier hearths, one had to light the fire on the platform itself and then move the cooking pots next to the charcoals (see above). In the case of the Room 12 hearth, however, there is a special device in the form of a rectangular enclosure of 0.70×0.40m that is screened off from the surrounding platform by a low mud wall. It contained ashes and charcoal. Additionally, there are three inbuilt stone slabs of different sizes in the northwestern angle of the hearth. The position of these stone slabs in the room is clearly off-center, but they are in contact with the hearth platform. Dikaios thought they served as bases for roof supports (1969/1971, 200), but they may have had a role in meal preparation, for putting aside vessels or portions of food, instead. The separation of fireplace and cooking platform on this hearth would have allowed for a more even heating of the cooking pots, for they did not come into direct contact with the charcoals and the flames. Possibly, the forerunners of this 11th century hearth are to be found in some 12th century hearths on the Greek Mainland (Jung 2012, 113). At Tiryns several hearths feature a layer of sherds, pebbles or small stones, which leave out a central space of circular shape from the paving (Maran and Papadimitriou 2006, 116–117, figs 21–23; Maran 2012, 126–128, figs 11.7–11.8). The upper mud layers of those hearths are missing or only partially preserved, but a possible reconstruction may look like the central hearth in Room 12,

Quarter 4 West of Enkomi IIIB. The three cooking pots from that room that I was able to examine have quite variable capacities.

Figure 11.14. Isometric reconstruction of Enkomi, Quarter 4 West, Level IIIA, with central hearths marked in red (after Dikaios 1969/1971, pl. 274)

*Figure 11.15. Traditional Calabrian cooking pots (*pignate*) in use at Caria, Calabria (southern Italy). Photo by R. Jung*

A very small cooking jug FT 65 of 11.8–12.0cm height and 7.5cm rim diameter can carry 0.4 liters, when filled to the bottom of the rim (Fig. 11.16). A very large specimen of FT 65 or 66 with one preserved handle is 32.2cm tall with a rim diameter of 19.0cm, and it can contain 10.2 liters (Fig. 11.17). Finally, a medium-sized cooking pot without preserved handle (possibly an example of FT 65, as it had either one or no handle at all) measures 20.0–20.6cm in height with a rim diameter of 12.5–12.7cm, and it has a capacity of 2.3 liters (Fig. 11.18). This set hints at a diversified cuisine with a cook or cooks preparing different dishes in well-defined quantities in specifically chosen vessels for a group of consumers.

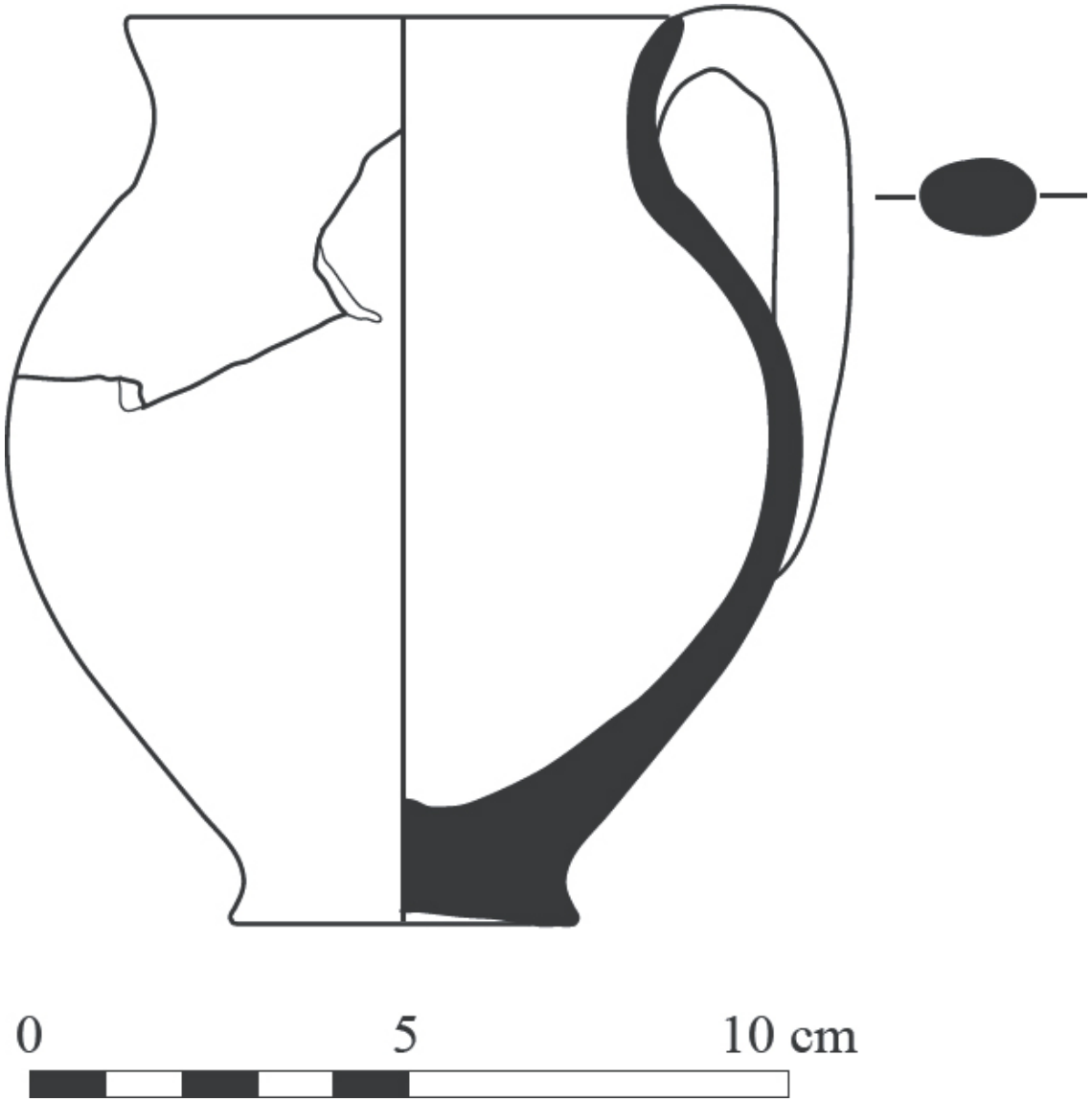

Figure 11.16. Wheelmade Mycenaean-type cooking jug from Enkomi, Level IIIB, Enk. 764. Drawing by R. Jung, digitization by R. Yassine. Scale 1:3

Other sites in Cyprus

When surveying publications of the past decades, we note that a remarkably consistent picture emerges for the whole of Cyprus. The development at Enkomi finds its parallels in various settlements in different regions of the island. In the Mesaória Plain, further inland from Enkomi at the site of Sínda a similar development seems to have taken place. The publications report a succession of handmade cooking pots in the LC IIC level (Sínda I) and wheelmade cooking pots in the LC IIIA level (Sínda II), but illustrations are insufficient to judge further details (Jung 2011a, 64).

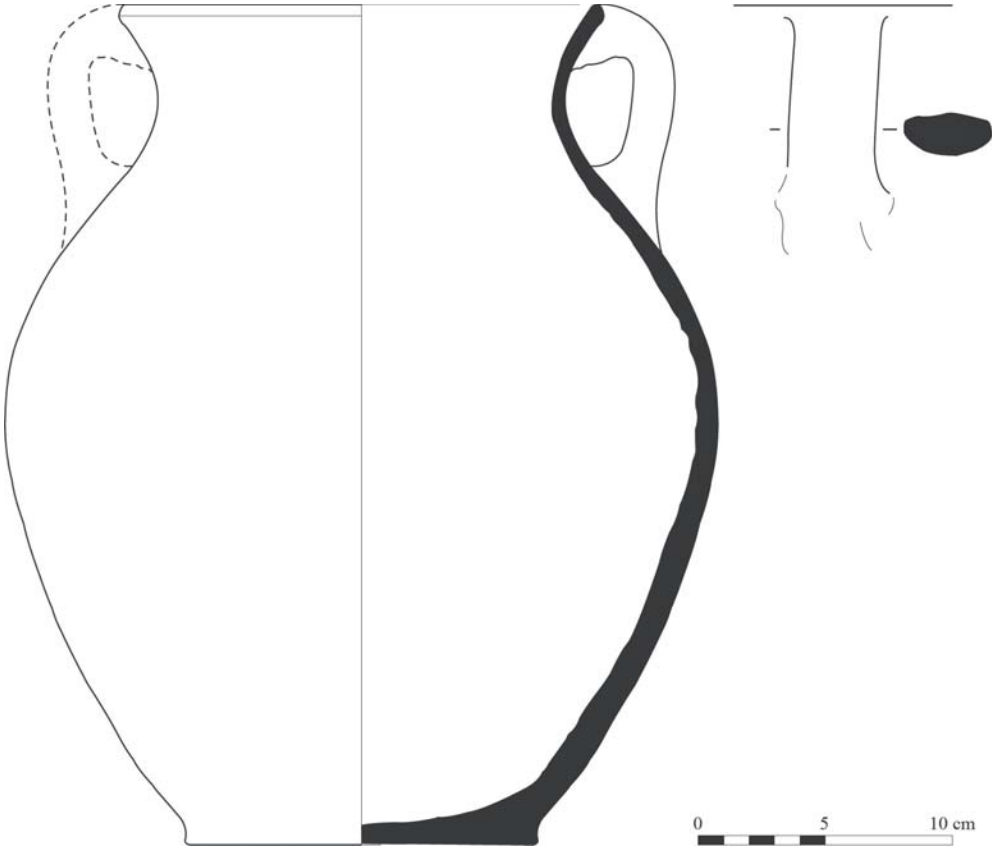

Figure 11.17. Wheelmade Mycenaean-type cooking pot from Enkomi Level IIIB, Enk. 234. Drawing by R. Jung, digitization by R. Yassine. Scale 1:3

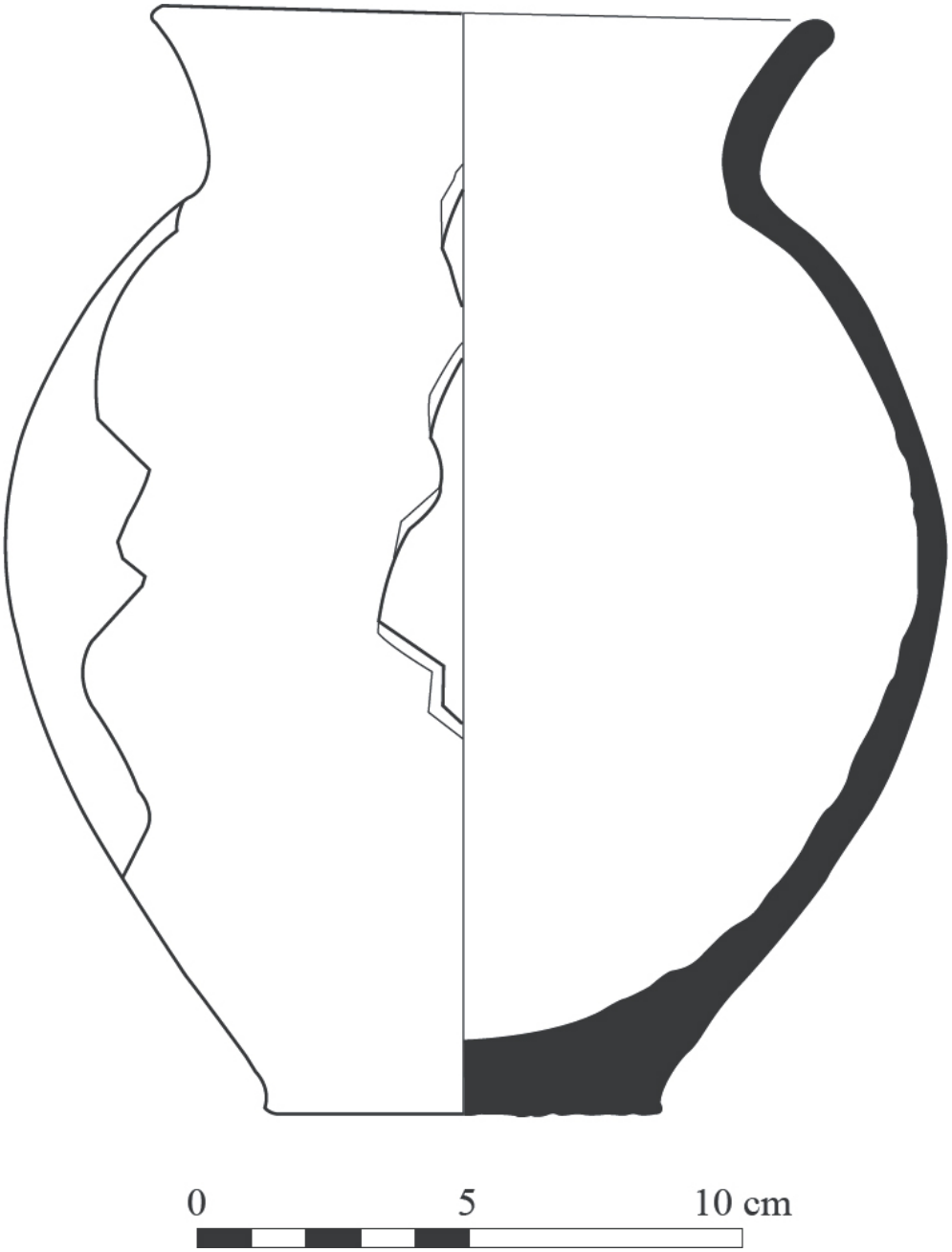

Figure 11.18. Wheelmade Mycenaean-type cooking pot from Enkomi, Level IIIB, Enk. 241. Drawing by R. Jung, digitization by R. Yassine. Scale 1:3

Further to the south, still inland, lies Athiénou-Pamboulári tis Koukkounnínas. The cooking pots from the LC IIIA Stratum II belong to FT 65 (Dothan and Ben-Tor 1983, 109–110, fig. 50.7, 111, 113, pl. 33.1–2) and are parallels for those from Enkomi Level IIIA, as are most of the painted Mycenaean vessels from the same stratum (Dothan and Ben-Tor 1983, 115–117, fig. 53.2–4, pl. 36.2, 37). One of the cooking jugs may even belong to the preceding Stratum III (Dothan and Ben-Tor 1983, 108–109, fig. 50.8 – *cf.* however *ibid.*, 111: assigned to Stratum II), which can at least be partly synchronized with Enkomi IIB based on the rest of the pottery (Dothan and Ben-Tor 1983, 139–140). No other cooking pots are published from that stratum, but a small and deep "Coarse Monochrome" pot with a vertical handle (Merrillees 1983, 31, 35, fig. 6.9) might have had such a function, as it is morphologically close to some round-bottomed and one-handled cooking pots from Pyla-Kokkinókremos.

Pyla-Kokkinókremos, a site inhabited contemporaneously with Enkomi IIB (Jung 2011a, 64–65), illustrates cooking habits prior to the introduction of Mycenaean cooking pots. The new excavations at the site have enlarged the spectrum of cooking pots considerably. The first excavations yielded various small to very small one-handled pots (Figs 11.19, 11.20) and a few fragments of larger, possibly two-handled cooking pots (Fig. 11.21), but the new excavations proved that the settlement spectrum was much more diverse, including cooking pots of many different sizes (Jung 2011a, 64–65, 82, fig. 6). In fact, in 2010 and 2011, specimens with rim diameters between 13–14cm and even very large ones of *ca*. 41cm maximum diameter came to light (Karageorghis and Georgiou 2014, 123–124, 131, cat. nos 4–6, 9, 111, 113, 150, pls II.4–6, III.9, 111, 113, IV.150). As at Enkomi IIB, all the Pyla cooking pots are handmade (Jung 2011a, 65; Georgiou 2014, 151) and mostly round-bottomed (rarely with a slightly flattened bottom), while they show considerable variability in proportions and size, attesting at least to variable food quantities if not qualities (*i.e*. to variability in recipes). The same exclusive presence of handmade Cypriot cooking pot types characterizes the LC IIC settlement of Kalavassós-Áyios Dhimítrios not far from the southern coast of the island (Russel 1989, 6–7, fig. 10).

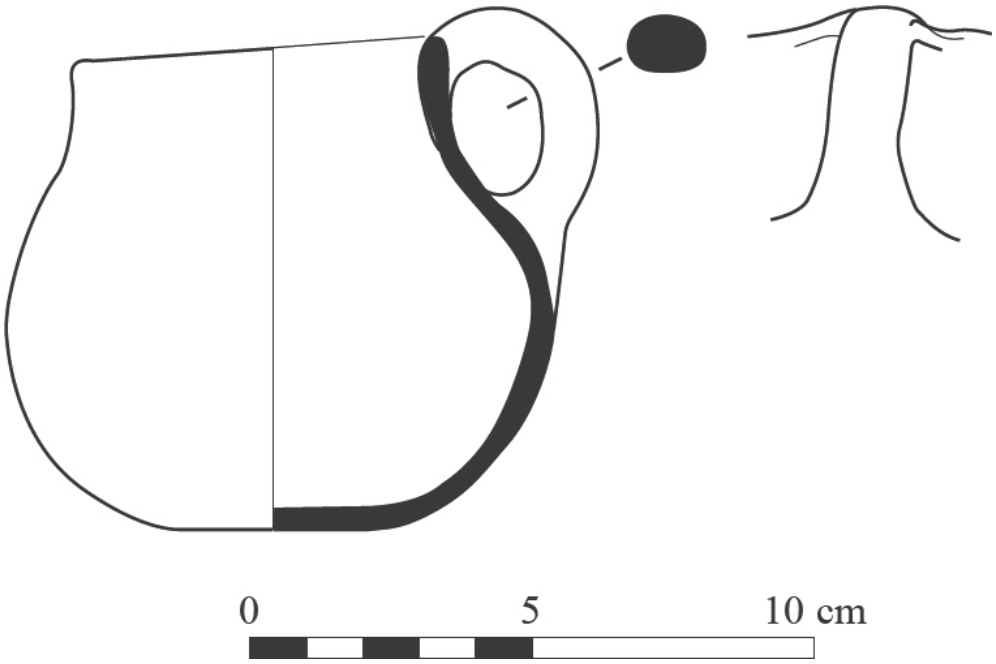

Figure 11.19. One-handled handmade cooking pot from Pyla-Kokkinókremos, no. 104. Drawing by D. Knauseder, digitization by R. Yassine. Scale 1:3

The two settlement levels of Maa-Palaeókastro on the west coast of Cyprus represent the stage after the introduction of Mycenaean cooking jugs FT 65 and cooking amphorae FT 66. The settlement was possibly founded during LC IIC (Karageorghis and Demas 1988, 255–259, fig. 1; Jung 2011a, 65–66), and several pottery categories attest to the persistence of certain LC II traditions. However, Mycenaean cooking jugs and amphorae were the predominant cooking pots at Maa in both of its settlement phases (Figs 11.9, 11.10, 11.11, 11.13), whereas only four fragmentary hand-made cooking pots of Cypriot tradition could be identified among the ceramics of the site (Jung 2011a, 66, 83, pls 7.1–3, 9.3). These stem from the earlier settlement level Floor II and may testify to an initial phase in which the Mycenaean cooking tradition had not yet totally replaced the indigenous one. Yet, there is stratigraphic evidence for the construction of hearth platforms already in the first stage of Floor II, *i.e*. in Rooms 61 and 75, in both cases with an underlying sherd layer

(Karageorghis and Demas 1988, 20, 41 pls 10.2, xvi.6–7, xxx.1, plans 7–8; Jung 2011a, 66–67), which suggests that the complete Mycenaean cooking equipment suite was in use from the very beginning of the earlier habitation period.

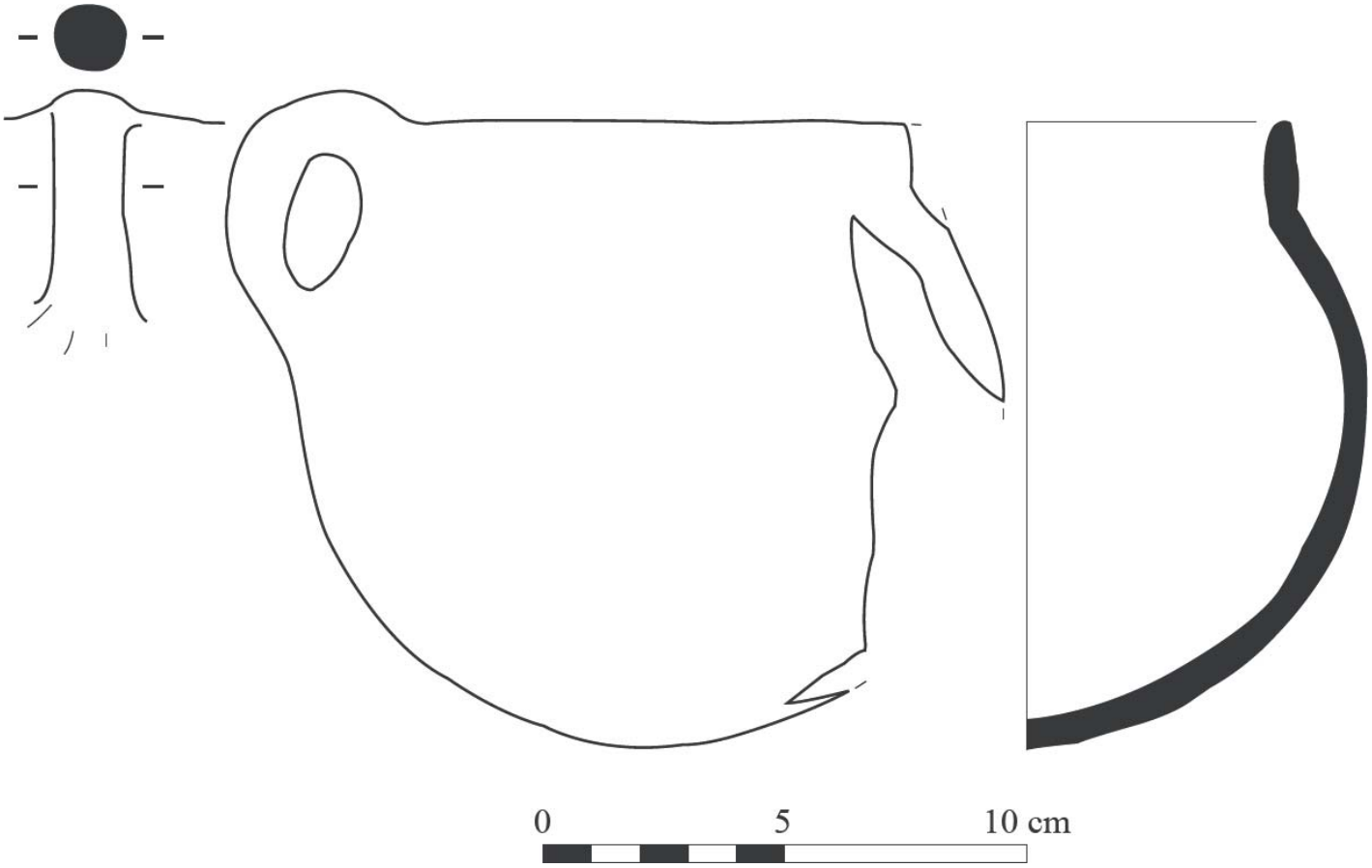

Figure 11.20. One-handled handmade cooking pot from Pyla-Kokkinókremos, no. 102. Drawing by D. Knauseder, digitization by R. Yassine. Scale 1:3

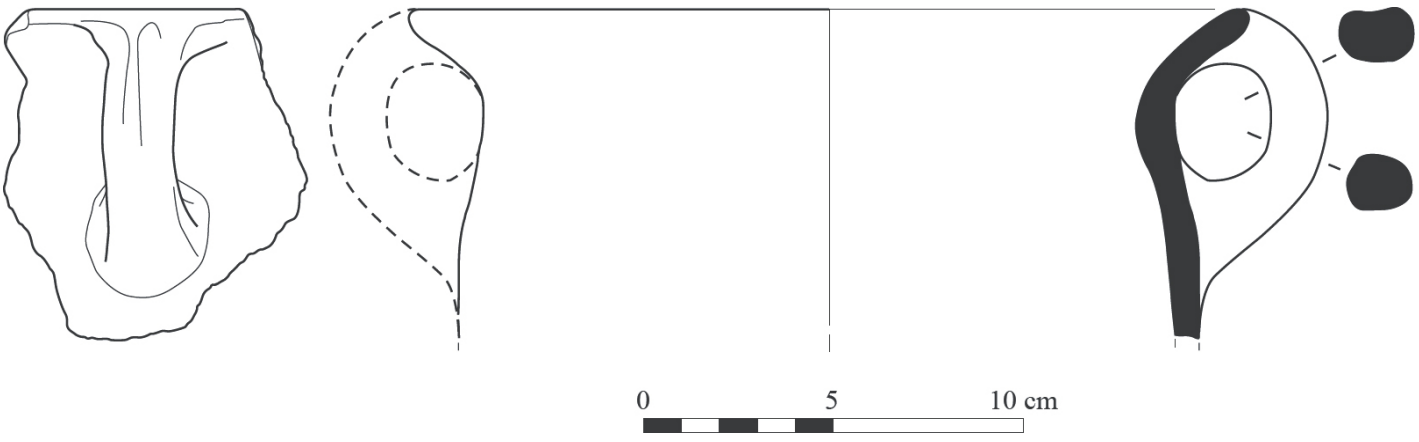

Figure 11.21. Handmade cooking pot from Pyla-Kokkinókremos, Sq MNO 8-9. Drawing by R. Jung, digitization by R. Yassine. Scale 1:3

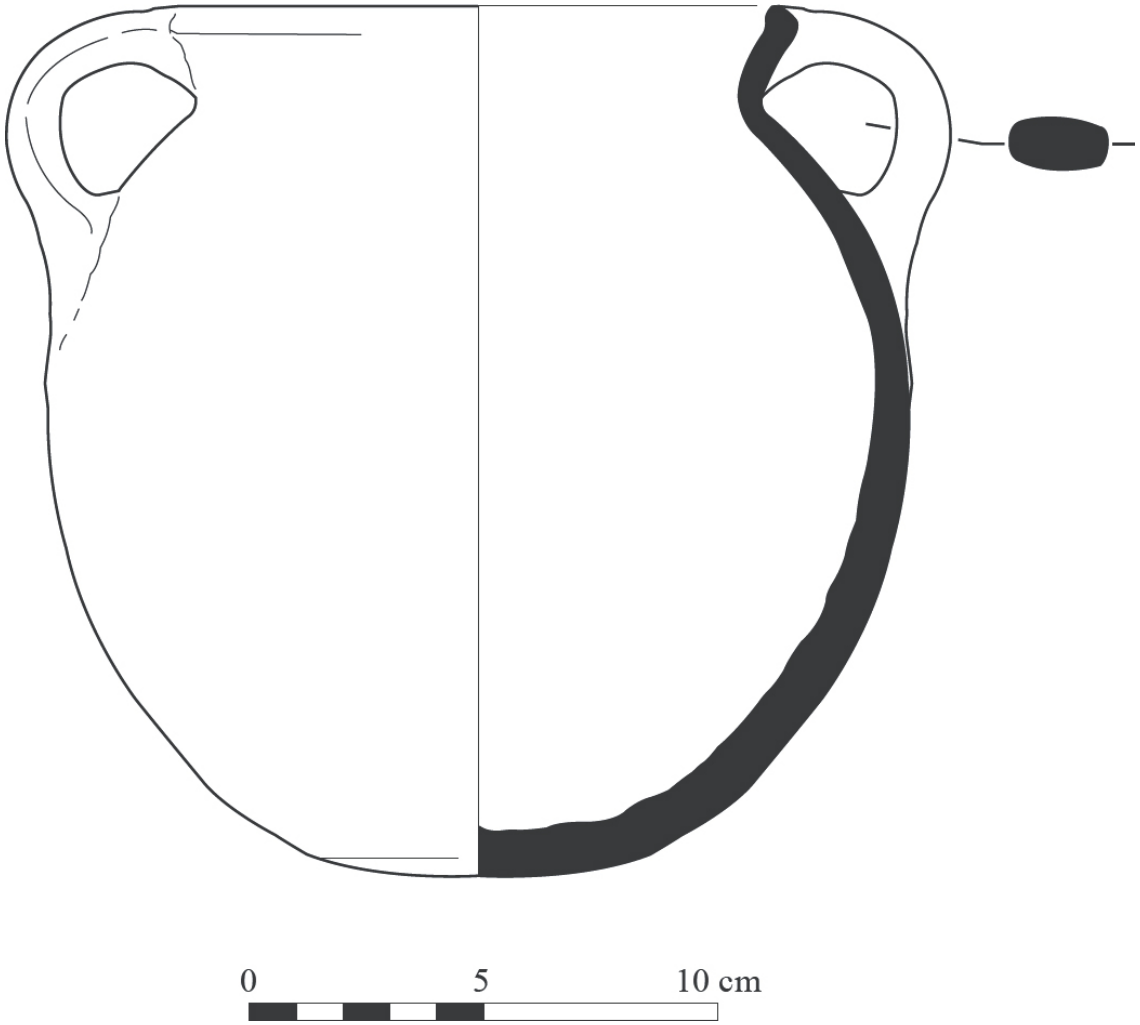

Figure 11.22. Wheel-finished Levantine-type cooking pot from Maa-Palaeókastro, Floor I, no. 358. Drawing by D. Knauseder, digitization by R. Yassine. Scale 1:3

The LC IIIA settlement level of Hala Sultan Tekke on the southeast coast also yielded various examples of Mycenaean cooking pots FT 65–66 (Fischer 2012, 93, 96, fig. 5.2; Fischer and Bürge 2014, 68, 72, 82, 84, figs 29.9, 30.3), but their number cannot be determined in proportion to other cooking pots on the basis of existing preliminary publications. Unfortunately, the publications of the earlier excavations very often do not provide the critical information, whether the illustrated cooking pots are hand- or wheelmade.

At Kition, less than 5km from Hala Sultan Tekke, only a few possible cooking pots were found during the excavations in the settlement Areas I and II. Those coming from LC IIIA levels are coarseware jugs with flat or ring bases, but from the descriptions it is not always clear if they are handmade or wheelmade. The excavators did not explicitly classify most of them as cooking vessels (Karageorghis and Demas 1985, 27 cat. no. 570 [“cooking-pot of Coarse ware”]; 137 cat. no. 3443 [handmade]; 147 cat. no. 5096 [wheelmade]; 148 cat. no. 5119 [wheelmade] pls 18.570; 44.570; 126.3443, 5096, 5119; 199.3443, 5096, 5119). However, a rim fragment with handle and a lower half of a vessel with raised concave base from Floor IV of Room 24 in Temple 2 might be the earliest Mycenaean-type cooking pots published so far from Cyprus (Karageorghis and Demas 1985, 89, cat. nos 3456 and 3457, pls. 107.3457; 187.3456, 3457). Both fragments are definitely wheelmade (autopsy by Mountjoy) and could belong to one or two cooking jugs or amphorae FT 65–66 with rim diameters of 12.5cm. Thus, the published reconstruction drawing that shows a round-bottomed cooking pot in a Cypriot tradition should be reconsidered. The stratigraphic context of these two fragments is of LC

IIC date and includes LH IIIB Early–Middle and LM IIIB pottery imports (Karageorghis *et al*. 1981, 6–7, cat. nos 6–9, pls 4.6–8, 5.9, 11.1–3, 14.25; Karageorghis and Demas 1985, 88–89, pls 107.2594, 187.2594).

At Álassa in southern Cyprus, at a distance of *ca*. 11km from the coast, an interesting variety of Cypriot handmade cooking pots is attested in both excavation areas, Páno Mandiláris and Paliotavérna. The better-preserved specimens show one handle and are bulgy with an out-turned rim with a diameter between 7.3cm and 21cm. However, unlike the cooking pots of Cypriot tradition found elsewhere on the island, some of the pots at Álassa have a flat bottom, not a rounded one (Spagnoli 2010, 24–25, 320–323, pls 113–114). It is important to note that this flat bottom is not a raised one, as is the case with the majority of Mycenaean-type cooking pots both in the Aegean (Pylos being an exception, see contributions in this volume) and in Cyprus. Rather, the pots simply have a flattened surface on the bottom that allows them to be stably placed on a flat surface. The only site where a similar cooking pot is attested is LC IIC Pyla-Kokkinókremos (Karageorghis and Demas 1984, 41, pl. 36.104; Jung 2011a, 65, 82, fig. 6.1). A further specimen may be present at LC IIIA Hala Sultan Tekke, but no description has yet been published (Fischer 2012, 93, 96, fig. 5.3).

The settlement areas of Álassa-Páno Mandiláris and of Álassa-Paliotavérna were inhabited since LC IIC, while their main habitation period was LC IIIA (Hadjisavvas 1989, 2003). In other words, handmade cooking pots were in use there, while in settlements further to the west (Maa-Palaeókastro) and to the east (*e.g*. at Enkomi) people had already replaced such traditional pots with wheelmade cooking jugs and amphorae of Mycenaean type. Moreover, the excavated architectural remains attest to the adoption of constructed hearth platforms by the inhabitants of Álassa. At least one rectangular hearth platform is documented at Álassa-Páno Mandiláris (Hadjisavvas 1991, 176, fig. 17.3: square Δ4, Room A, "πυρά"). At Álassa-Paliotavérna, a freestanding hearth occupies a central position in the LC IIIA phase of Building II (Hadjisavvas 2003, 435–436), but its construction features are not yet published in detail. This might mean that the habit of cooking on hearth platforms had already spread from the coastal settlements to Álassa, but the local people did not adopt the new manufacturing techniques for kitchenwares at the same time. This picture of selective adaptation of novelties would fit with Hadjisavvas's observation that certain wheelmade fineware shapes common at Enkomi IIIA or Maa-Palaeókastro (Floor II) such as deep bowls FT 284/285 were not used, while others such as strainer jugs that are also innovative types during LC IIIA did seem attractive to consumers at Álassa (Hadjisavvas 1991).

Even further in the interior of the island, in the central zone of the copper mines in the Troodos Mountains at Aplíki-Karamállos, we find attestations of Mycenaean types predominantly known from LC IIIA contexts elsewhere. These include painted deep bowls FT 284/285 that are also attested at Maa-Palaeókastro (Kling 2007, 161–162, 220, pl. 55). The radiocarbon dates on charred baskets and seeds are also in accordance with a destruction of Aplíki in the 12th century BC or during LC IIIA (Manning and Kuniholm 2007). However, the Aplíki cooking pots seem to be confined to handmade shapes of the indigenous Cypriot tradition (Kling 2007, 125–126, pl. 35–36.1 – where she notes that "most examples are handmade, some show traces of wheelmarks inside," while none of the illustrated pieces can be ascribed to a Mycenaean FT 65 or 66 with any certainty). Again, but with a different repertoire than at Álassa, we see an interior site selectively adopting Mycenaean novelties that were more broadly accepted in some of the principal seaports of the island.

Levantine cooking pots in LC IIIA contexts

Although the most important innovation in the Cypriot kitchen during LC IIIA was the introduction of Mycenaean cooking jug and amphora FT 65–66 together with the adoption of hearth platforms, we can note another innovative tendency in the kitchenwares of the 12th century BC, *i.e*. the use of Levantine cooking pots at certain settlements. At Enkomi, such cooking vessels are very rare exceptions in Level IIIA (Jung

2009, 80, 84, 92, fig. 6.3; Jung 2011a, 60, 73, 81, fig. 4.4), while at Maa-Palaeókastro they are present in the later settlement phase Floor I, with at least three specimens (Fig. 11.22). Likewise at Hala Sultan Tekke, cooking pots of Levantine shapes were in use (Åström 1998, 111–112, figs 246–247).

The few extant vessels belong to different Levantine types; some are handleless, while others have handles. Some are wide and rather shallow vessels with a slightly carinated profile according to the Late Bronze Age tradition, others are deep-bodied and belong to the new shapes of the Levantine Early Iron Age I, *i.e.* the 12th century (Jung 2011a, 60, 67–68, 73, 81, 84, fig. 4.4, 8.1–2). The Levantine cooking pots at Maa-Palaeókastro were most probably wheel-finished, in contrast with the wheel-thrown Mycenaean FT 65–66 from the same site (for detailed discussion see Jung 2011a, 67–68, 85, fig. 9.6). Judging from pottery statistics (so far available only for Enkomi and Maa-Palaeókastro, see above), the various shapes of Levantine cooking pots were clearly much less current than the usual Mycenaean types. They should be seen in context with transport jars of Levantine types, the so-called Canaanite jars, which were common in the very same LC IIIA settlements located at or near the Cypriot coast (Hadjicosti 1988; Åström 1991; Pedrazzi 2007, 348–349). To be sure, the transport jars are much more numerous than the Levantine cooking pots. At Maa-Palaeókastro, for instance, Maria Hadjicosti counted a minimum of 84 Canaanite jars, among which were 39 from Floor I and 18 from Floor II (Hadjicosti 1988, 349–350), while there were only three certain Levantine cooking pots, all from Floor I. Those "Canaanite jars" attest to intense exchange relationships between the populations of the island and those living on the opposite coasts of the mainland (Sherratt 2003, 47; Bell 2006, 96; for petrographic analyses and Atomic Absorption Spectrometry of Canaanite jars from Maa see Jones and Vaughan 1988). Harbor settlements such as Hala Sultan Tekke or Maa-Palaeókastro certainly housed sailors of different origin – at least on a temporary basis. The few Levantine cooking pots may suggest that cooks in these settlements took care to meet their demands for food cooked in a familiar way. Of course, one may also imagine that local inhabitants developed a taste for Levantine dishes, but again this would presuppose that sailors brought with them their knowledge of Levantine food and how to prepare it – be they Levantines or Cypriots with Levantine experience.[6]

Conclusions

The culinary history of Late Bronze Age Cyprus can be broken down into two basic stages. The first stage continued a long indigenous tradition dating back to the Early Cypriot period, constituting the latest phase of that history. Cooking pots were hand-made and round-bottomed, but they could have different dimensions. Kitchen installations had become much simpler than they had been at the onset of the Bronze Age cooking history. Hearths had nearly no architecturally designed shape and could be set up almost anywhere by lighting a bonfire fueled with wood or charcoal. A cooking pot was then placed right on top of the coals. This earlier stage ended with LC IIC in most of the settlements on the island, including Enkomi IIB, Pyla-Kokkinókremos, and Kalavassós-Áyios Dhimítrios. It seems that only at a very few sites such as Álassa people continued to use predominantly elements from the traditional Cypriot kitchen during the succeeding LC IIIA phase.

The principal novelty of LC IIIA around the island was the introduction of flat-based cooking pots that corresponded in all details to the Mycenaean one-handled cooking jugs FT 65 and the two-handled cooking amphorae FT 66. The different forms of tripod cooking pots FT 320 were not used in Cyprus, with a very few exceptions. By contrast, Cypriot cooking pots were given up after a transitional period of perhaps a few years at the beginning of LC IIIA in most settlements. The new cooking pots came into use in both newly founded settlements such as Maa-Palaeókastro and in continuously inhabited ones such as Enkomi, Athiénou, and Hala Sultan Tekke. Moreover, the new cooking pots meant installing entirely new hearths, *i.e.* platforms that were a feature adopted also from the Aegean including all construction details.

The total replacement of the local kitchen equipment with a whole new kitchen set from the Aegean was a break with tradition even more radical than the one observed in Early Iron Age Palestine. In that region, Mycenaean cooking vessels only partially substituted for the old Levantine ones in the presumed settlements of the Philistines (Yasur Landau 2010, 228–234, table 7.3). At Ashkelon, for instance, the frequency of Mycenaean-type cooking jugs FT 65 and amphorae FT 66 reached 54 % of all cooking pots in the first phase of their appearance, to rise to 85% in subsequent phases (Master 2011, 262, 272, fig. 7.1–6). This is a much slower and less complete replacement of local shapes than in Cyprus.

In Cyprus, the changes in cooking habits were accompanied by other changes in the pottery repertoire, again going back to the Aegean. The Enkomi sequence provides us with the clearest picture of that change. Handmade finewares, the backbone of table wares in Level IIA and still in Level IIB, disappeared from households almost completely during Level IIIA. In addition, the popularity of painted Mycenaean pottery rose abruptly. More importantly, although Mycenaean-type pottery had been in use already by Level IIB, the painted Mycenaean pots of Level IIIA that were most probably locally produced cannot be interpreted in terms of local continuity, because the type repertoire had changed markedly. The wheelmade finewares of Enkomi IIB depended on local pottery utilization patterns with an emphasis on shallow bowls; these were either Aegean imports or local Mycenaeanizing products, in which Cypriot and Mycenaean stylistic elements had been combined. By contrast, Mycenaean types that were also common in the Aegean dominated the painted table wares in Level IIIA, types such as deep bowls FT 284/285 and shallow angular bowls FT 295C (Jung 2011b, 175–181, 191–195, figs 2–7). Once this basic change is realized, from a phase in which Mycenaean products were selected according to local traditions (in the case of imports) or adapted to those traditions (in the case of Mycenaeanizing types) toward a phase in which foreign shapes and perhaps also use habits were adopted, the continuity in the local use of Mycenaean fine wares from Enomki IIB to Enkomi IIIA appeares only as a superficial one, evoked by the generalizing term “Mycenaean.”

Burial rites show another important cultural discontinuity at Enkomi. Intramural chamber tombs, typically used for multiple burials throughout the island during LC II, were largely given up by Level IIIA. They were only partly replaced by intramural simple graves; the main cemetery must have existed elsewhere (Dikaios 1969/1971, 431–434; Jung 2011b, 184–185 with further bibliography).

Giving up traditional meal preparation and consumption as well as established burial rites at the same time meant a considerable break in everyday habits as well as in fundamental ideological imperatives. In cases in which this break was as radical as it was at Enkomi, it is difficult to find an explanation for the discontinuity that would not involve the immigration of a considerable number of people who would bring the new habits and ideology with them. If the changes from Enkomi IIB to IIIA were mainly the result of an economic overthrow, a social and political revolution caused by a significant development of the forces of production that had been constrained by the social and political system of the 13th century BC, the changes in material culture should reflect the new relations of production of the 12th century. However, those changes in material culture that were described above do not seem to be have been linked in any direct way to a new economic and political system. The remarkable degree of borrowing from external (*i.e*. Mycenaean) everyday practices must rather be explained by ideological factors than by economic ones. Of course, the shift in production technology from handmade pottery to wheelmade could have promoted the use of Mycenaean-type pots. However, already by the time of Enkomi Level IIB, a considerable part of the unpainted pottery corpus was wheelmade, but this did not affect the production of cooking vessels (Jung 2011b, 177–178, 182, 191–192, figs 2–3). Moreover, the differences between cooking pots of Enkomi IIB and IIIA are not confined to production technology but include profound changes in how those pots were used in the kitchen.

The installation of a new ruling class by means of military conquest might explain some innovations propagating the new political regime and its ideology to the ruled, but a political change of this kind should

have more effect on architecture, official religion or luxury goods than on basic food consumption. In the absence of any substantial funerary record for the phase Enkomi IIIA (see above), all hypotheses on the composition of the ruling class of that phase would be highly speculative and problematic. However, if only a very small group of new rulers had been immigrants, it would be strange to imagine the local population not only imitating foreign innovations very quickly in almost every kitchen in town, but also simultaneously abandoning their own local traditions. One may justifiably ascribe the monumental ashlar building of outstanding architectural quality in Quarter 4 West to members of the ruling class of Enkomi IIIA, but the same new types of cooking pots and the same kind of innovative hearth platforms were in use also in the ordinary settlement Quarter 1 West, albeit in the form of less elaborate constructions (see above, p. 134).

Preparing and consuming food and drink within the household takes place in an internal spatial and social realm in which there is less interaction with and pressure from the society than in a public space. Therefore, traditional habits confined to the internal household realm may persist, even in a situation where immigrants try to adapt to a new social environment in another country (Burmeister 1996, 15–17; 2000, 541–542). One can, therefore, expect that immigrants from the Aegean were active in those cases where we see a very profound change in domestic habits coupled with other changes departing from long-established Cypriot traditions. However, more data on other aspects of everyday life such as the kinds of food and drink consumed, social and political organization, etc., would provide us with a better understanding of the historical processes during the transition from LC IIC to LC IIIA.

While we see fundamental changes in several regions of the island, in others the local tradition prevailed to a large degree during LC IIIA. People in those contexts only partly adopted and thereby adapted Mycenaean innovations to local traditions. Interestingly, the inhabitants of Álassa adopted the use of cooking pots on hearth platforms but not their production on the potters' wheel. This suggests that the impetus for adopting the novelty was not economic. In the case of Álassa the impact of Mycenaean culture seems to have been an indirect one, mediated via intense relations with neighboring settlements, the populations of which were already using a new material culture of Mycenaean derivation.

Fabric descriptions of cooking pots from Enkomi

As discussed above, changes in cooking pottery reflected not only a new method of use of kitchen vessels, but also new production techniques, *i.e*. a change from handmade to wheelmade technology. Fabric descriptions can help us to understand those technological changes. Therefore, I provide descriptions of the two basic fabrics used for handmade cooking pots during Enkomi Levels IIA and IIB and of three of the most popular wheelmade fabrics of Enkomi Levels IIIA and IIIB. These fabric descriptions are macroscopic ones made by an archaeologist. They serve to classify according to technological characteristics all the ceramic finds studied by the author. This fabric classification is not meant to supplement petrographic analyses and the definition of so-called *petrofabrics*. Rather, one may compare chemical groups (or also petrofabrics of a possible future project), that are necessarily based on a restricted number of samples, with these macroscopically defined fabrics for drawing conclusions on the whole body of studied material.

Handmade fabrics

Ha1. Fired very hard (if hit, sherds clink); surface wet-smoothed, rim sometimes wheel-finished. Color of surface (mottled): 7.5YR 4/2, 4/3 (brown), 5/2, 5/3 (brown) and black (mainly on the inside). Color of break: dark gray, at the edges 7.5YR 5/4 (brown). Pottery matrix with large number of fine to coarse voids; (medium to) large number of non-plastic inclusions of medium to coarse (sometimes very coarse) size, inclusions mainly white, sometimes dark in color.

Ha2. Fired very hard (if hit, sherds clink); surface wet-smoothed. Color of surface (mottled): 7.5YR 5/2, 5/3 (brown). Color of break: 5YR 5/6 (yellowish red). Pottery matrix with large number of fine to coarse voids; large number of non-plastic inclusions of medium to coarse size (more white than dark ones).

Wheelmade fabrics

U 10. Fired very hard; surface not specially smoothed, fine wheel-marks visible; feels sandy. Color of surface: between 5YR 5/4 and 4/4 (reddish brown). Color of break: 5YR 4/6 (yellowish red), core gray. Pottery matrix dense; large number of non-plastic inclusions of medium to very coarse size (white particles).

U 14. Fired very hard; surface slightly wet-smoothed, fine wheel-marks vivible in many places; feels sandy. Color of surface: *ca*. 10YR 6/4 (light yellowish brown). Color of break: *ca*. 10YR 6/4 (light yellowish brown). Pottery matrix with small number of medium-sized voids; large number of fine to coarse non-plastic inclusions (white and dark gray particles).

U 15. Fired very hard; surface not specially smoothed, fine wheel-marks visible; feels slightly sandy. Color of exterior surface: 2.5YR 4/3 (reddish brown), 5YR 5/4 (reddish brown), 7.5YR 5/4 and 4/2 (brown). Color of interior surface: dark gray (not in all cases). Color of break: between 7.5YR 5/4 and 4/4 (brown), core dark gray (not in all cases). Pottery matrix dense; large number of non-plastic inclusions (white particles) of mainly fine size, but including some coarse ones.

Results of chemical analyses

(with H. Mommsen)

A program of Neutron Activation Analyses including pottery samples from Enkomi, Pýla-Kokkinókremos, and Maa-Palaeókastro[7] confirmed the trajectory of Cypriot cooking pots outlined above. Three handmade cooking pots and a coarse handmade bowl from Enkomi Level IIB (Late Cypriot IIC) turned out to be chemical singles (Table 11.2). They had been assigned to the two fabrics Ha 1 and Ha 2 described above.[8] However, chemical analyses did not confirm those two groups, but rather a multitude of different chemical compositions. In combining the results of fabric classification and chemical groupings, one may deduce that potters did share certain common practices when producing cooking pots, but at the same time their ways of obtaining and preparing potter’s clay were not standardized.

Table 11.2. Cooking pots from Enkomi, NAA results

	X076 9 samples		*Enkj11 1 sample*		*Enkj12 1 sample*		*Enkj13 1 sample*		*Enkj14 1 sample*	
	M	σ(%)	C	δ(%)	C	δ(%)	C	δ(%)	C	δ(%)
As	20.1	(50.)	3.28	(4.5)	1.77	(10.)	10.9	(1.6)	2.06	(7.8)
Ba	394.	(30.)	145.	(57.)	133.	(27.)	272.	(31.)	229.	(32.)
Ca\%	5.10	(22.)	1.19	(13.)	3.26	(6.7)	2.54	(6.5)	4.46	(5.2)
Ce	53.6	(1.9)	12.6	(2.6)	7.68	(4.2)	20.2	(1.7)	11.5	(2.8)
Co	23.5	(6.1)	33.1	(0.4)	36.2	(0.4)	43.2	(0.4)	32.1	(0.4)
Cr	722.	(12.)	42.7	(1.5)	52.0	(1.3)	171.	(0.5)	91.7	(0.7)
Cs	3.89	(13.)	0.45	(25.)	0.34	(33.)	0.70	(16.)	0.46	(23.)
Eu	1.21	(4.2)	0.75	(2.9)	0.53	(4.0)	0.79	(2.8)	0.58	(3.5)
Fe\%	5.22	(5.7)	10.0	(0.2)	6.92	(0.3)	8.02	(0.3)	6.23	(0.3)
Ga	17.6	(22.)	26.1	(15.)	15.2	(32.)	16.8	(26.)	15.5	(26.)
Hf	3.97	(4.3)	2.26	(2.7)	1.52	(4.0)	2.47	(2.5)	1.36	(4.1)
K\%	2.18	(7.2)	0.80	(4.5)	1.02	(5.2)	0.89	(4.6)	1.00	(4.3)
La	25.9	(6.5)	4.57	(1.0)	2.99	(1.9)	9.09	(0.7)	4.98	(1.1)
Lu	0.42	(4.5)	0.56	(2.6)	0.47	(3.1)	0.49	(3.1)	0.42	(3.3)
Na\%	0.92	(14.)	1.28	(0.6)	2.82	(0.5)	1.40	(0.6)	2.46	(0.5)
Nd	20.1	(12.)	10.4	(27.)	4.81	(61.)	12.5	(23.)	3.92	(61.)
Rb	80.3	(5.9)	23.1	(11.)	13.2	(18.)	21.3	(12.)	14.8	(15.)
Sb	0.80	(14.)	0.29	(10.)	0.12	(30.)	0.32	(9.6)	0.19	(18.)
Sc	21.2	(2.9)	36.8	(.08)	39.9	(.08)	38.1	(.08)	34.5	(.08)
Sm	3.89	(5.6)	2.24	(1.8)	1.39	(2.9)	2.50	(1.7)	1.49	(2.3)
Ta	0.72	(6.2)	0.11	(44.)	0.16	(31.)	0.36	(13.)	0.11	(41.)
Tb	0.68	(11.)	0.56	(13.)	0.39	(18.)	0.43	(16.)	0.36	(17.)
Th	7.91	(3.7)	1.27	(4.9)	0.87	(7.1)	2.51	(2.6)	1.14	(5.2)
U	1.67	(12.)	0.60	(34.)	--		0.49	(43.)	--	
W	2.22	(15.)	2.24	(11.)	3.35	(9.2)	2.49	(11.)	1.79	(15.)
Yb	2.56	(4.7)	2.83	(1.9)	1.92	(3.3)	2.37	(2.3)	1.94	(3.1)
Zn	94.3	(19.)	90.2	(2.5)	112.	(2.0)	144.	(1.7)	63.2	(3.3)
Zr	170.	(15.)	88.7	(32.)	46.2	(61.)	128.	(22.)	66.9	(39.)

Given are average concentrations M and variances σ for the group X076 and raw concentrations C and measurement uncertainties δ for the single samples in μg/g (ppm), if not indicated otherwise. All single samples have very different compositions, compare *e.g.* the low Cs, La, and Th and the higher Sc values (H. Mommsen, Bonn)

Wheelmade Mycenaean-type cooking jugs FT 65 and/or cooking amphorae FT 66 from Enkomi Level IIIA (Late Cypriot IIIA) are chemically much more homogeneous. The distinct fabrics that have been macroscopically defined (see above), are characterized primarily by the non-plastic parts of the clay paste, whereas the chemical analysis looks at a different parameter set stored mainly in the plastic parts, namely the trace elements in the clay minerals. These fabrics therefore point to different paste preparation recipes using clays with not very different elemental composition. Nine samples of those cooking pots of Mycenaean type belong to a chemical group that can be ascribed to the site of Enkomi because of the geographical distribution of the group members in Cyprus (Table 11.2).[9] The group is almost exclusive to Enkomi itself. Two further Mycenaean-type cooking pots from Enkomi Level IIIA are chemical singles (samples Enkj 15 and 17).

We may draw two main conclusions from these results. First, cooking pot manufacture at Enkomi

developed from a non-standardized (possibly household-based or decentralized) production in Late Cypriot IIC toward a much more standardized and hence possibly workshop-based or centralized one by LC IIIA. There is no continuity in clay paste preparation between handmade cooking pots of traditional Cypriot types from the 13th century BC and wheelmade cooking pots of Mycenaean type of the 12th century BC. This result adds a further element to the already noted technological discontinuity in the production of kitchen wares between those two consecutive settlement phases. Thus, the changes include typological and functional innovations (new flat-bottomed shapes used on hearth platforms) on the one hand and technological innovations (manufacture on the potters' wheel and new clay recipes) on the other.

Notes

1 The research in the museums of Cyprus in 2009 and 2010 was financially supported by the Leventis Foundation, the Institute for Aegean Prehistory and the University of Salzburg. The Austrian Academy of Sciences provided the necessary funding for conducting the NAA. I would like to thank Elisabetta Borgna, Lindy Crewe, Ariane Jacobs, and Sara Levi for illuminating discussions. Francesco Rombolà and Ferdinando Staropoli explained to me the Calabrian way of cooking in traditional ceramic cooking pots (*pignate*), for which I am very grateful.

2 Capacity calculation was done with a program provided by the Centre de Recherches en Archéologie et Patrimoine of the Université Libre de Bruxelles; see http://capacity.ulb.ac.be/index.php.

3 For petrographic assignment of this vessel to an inland region close to the Troodos see Pilides and Boileau 2011, 117, 124, fig. 1, 126, fig. 4–4a; for the stratigraphic context at Enkomi, see Jung 2009, 80 with n. 16.

4 Dikaios also mentions a hearth "horse-shoe shaped in plan (Diam. 0.50m) with a low rim of stones and mudbricks" from Room 65 in Level IIB (1969/1971, 71), but neither the plan nor the stratigraphic section show any such hearth (pls 254, 264.3). By contrast, the hearth of the adjacent Room 64 has a horse-shoe shaped plan, but in Level IIIA (pl. 254). However, the reported level of the hearth at "-14.50 m" in Room 65 would fit with a Level IIB stratigraphy (pl. 264.3).

5 Such underlying sherd layers with apparently the same function are also known from much earlier (early Middle Bronze Age) ovens at Prehistoric Olynthus (toumba of Áyios Mámas) on the Chalkidikí peninsula (Hänsel and Aslanis 2010, 68–69, fig. 35).

6 As an analogy one may mention the two later (8th century BC) shipwrecks detected between Egypt and the Gaza strip, on which single cooking pots made in Lebanon (according to petrography) were found in addition to the load consisting of Canaanite amphorae. Obviously these cooking pots had been used by the crews: two cooking pots on the one ship and four on the other (Ballard *et al*. 2002, 158–161, 166, figs 7.1–2, 8, 9.7–10).

7 To be fully published elsewhere.

8 Samples Enkj 12–14 represent Ha 1, and sample Enkj 11 represents Ha 2.

9 Samples Eknj 16, Eknj 18–19, Enkj 21–26. These samples represent the above mentioned fabrics U 10, U 14, and U 15 as well as other, less frequent cooking pot fabrics.

12

Mycenaean cooking pots: A North American perspective

Michael L. Galaty

When I wrote my dissertation in the late 1990s (Galaty 1999), I could find almost nothing published on Mycenaean cooking pots, a problem also experienced by many of the contributors to this book. Such publications did not exist or were buried deep within excavation reports. When cooking pots were presented by Aegean archaeologists, it was often in piecemeal fashion (Trusty, this volume); thus the data from these earlier studies cannot be trusted, or should be used with great care (as by Gorogianni *et al*. on Kea and Vitale and Morrison on Kos, this volume). But the situation is changing, and changing fast. As noted by Hruby and Trusty in the introduction, "the study of cooking ware is becoming a flourishing enterprise" (this volume). That being the case, it is essential that we determine why we care about cooking pots. What are we trying to learn from them? As many of the contributors to this volume indicate, when it comes to cooking pots we are clearly still in a descriptive phase of analysis, but are moving quickly toward interpretation. We should be defining research questions now, not after the fact.

Do we want to use coarse pots as chronological markers, in contexts where fine decorated pottery is lacking? Do we aim to use coarse wares like cooking pots to reconstruct behaviors relating to food and eating, and thereby define cultural similarities and differences? Might such pots reveal various shifting kinds of intercultural interaction? Do pots equal people?

In framing such interpretive questions, and in refining methods, we can learn from other regions of the world where there is a long tradition of coarse pottery study and form- and fabric-based typologies. In this paper, I will use Eastern North America as a comparative example and define a set of methodological goals for the study of cooking pots in the Aegean. These goals will be further developed with reference to the papers in this volume.

The study of pottery in Eastern North America

The study of pottery in the Eastern United States (*i.e*. roughly east of the Mississippi River) can be linked to

the historical particularism of Franz Boas and his students, who were concerned with learning as much as they could about Native American cultures before they disappeared (which, of course, ultimately they did not do). In the absence of pre-Columbian texts, their methods depended on ethnography and "culture history," connecting living Native Americans to their ancestors through the material record. When the limits of the culture-historical approach became apparent, North American archaeologists turned to studies of "process": what might the archaeological record teach us about human behavior generally? In the absence of highly decorated pots, North American archaeologists developed methods for analyzing plain pottery, including cooking pots, in order to address cultural-historical and later processual, *i.e*. behavioral, questions.

By comparison, Aegean archaeologists were initially motivated by different theoretical concerns and developed different methods for studying pottery. Unlike North American archaeologists, Aegean archaeologists did have access to written records and texts and could cross-reference painted Aegean pottery and calendar dates. Highly decorated Mycenaean pots were studied using art historical methods, found to change systematically, and employed as relative chronological markers. In the absence of painted pottery, archaeologists working in Eastern North America turned to radiocarbon dating to create absolute chronologies, which served well the processual theoretical turn. Recently, Aegean archaeologists have also sought to address archaeological process, only to discover that the pottery typologies they possess are ill-suited to processual analysis, a problem compounded by the lack of radiocarbon chronologies. Ironically, dependence on the study of plain pottery, including cooking pots, better positioned North American archaeologists to address processual questions. The contributors to this volume, all of whom are Aegean archaeologists, also ask processual questions that indeed are best addressed through the study of cooking pots, but they lack suitable datasets and methodologies. A closer look at the so-called Type-Variety System employed in North America (Wheat *et al*. 1958) points to various weaknesses, and some strengths, in Aegean traditions of pottery analysis.

The Type-Variety System was adapted by Phillips (1958; 1970) to the Eastern United States, producing names like "Baldwin plain" and "Tishimingo cord-marked." Unlike the Aegean, the Eastern North American decorative repertoire was limited, so archaeologists focused on technological attributes, such as fabrics and to a lesser extent forms, producing so-called "wares," which subsumed types and varieties. The names produced also carry spatial information, typically referring to a site, county, or sometimes a historic tribe. Despite being almost universally adopted in the Eastern United States, the Type-Variety System has been broadly criticized (see review in Galaty 2008).

The ware concept is particularly problematic. Wares, as described by Phillips and later archaeologists, are very poorly defined (Rice 1976). Ware descriptions are non-formalized and overly qualitative, employing terms like "chalky, lumpy, and lamellar." The temper types identified are few and limited – sand, grit, and grog – measured in relative terms: more or less, presence-absence, etc. As a result, there exists little agreement amongst specialists regarding what characterizes particular wares, which tend to cross-cut types and varieties, leading to confusion. When mapped, wares often overlap spatially, mixing types and varieties that are meant to reflect meaningful social-behavioral groups, such as tribes.

Moreover, because wares represent poorly defined, non-exclusive categories, they encourage the proliferation of types and varieties. In constructing typologies, archaeologists are typically forced to decide whether to create more or fewer groups, whether to lump or to split. When categories are not well defined, the tendency is to split. For example, Phillips (1970) identified 77 types and 197 varieties for the Lower Mississippi Valley alone, and many more have been added since then. Consequently, it is difficult, if not impossible, for any single archaeologist to know all the types, varieties, and ware designations for any given region. Often different archaeologists who work in the same region give different names to identical pieces of pottery, leading to non-reproducible, non-functional typologies (Smith 1979).

Finally, it is unclear what types and varieties, let alone wares, represent (Gifford 1960). Do they

represent ethnic groups, each of which made a different kind of pottery? Do they represent villages, which may or may not have traded with each other? In fact, given a domestic mode of production, and given that all pottery in pre-Columbian North America was handmade, it is likely that pots were manufactured by women and their daughters (Galaty 2008, 245–246). Thus, when archaeologists identify types, varieties, and wares, they are actually recovering, at the most basic level, the paste recipes and techniques developed, used, and shared by prehistoric Native American women. As such, how and why pots were moved between sites and what this says about Native American territories, histories, and lifeways remains an open question.

Many of the problems with the Type-Variety System and the ware concept identified above might be solved if archaeologists working in Eastern North America understood better the pottery-making process, a point made early on by various scholars, including Weaver (1963) and Shepard (1964). How pots were made would have been strongly conditioned by access to raw materials, such as clay and temper, but Eastern North American archaeologists have generally ignored such limiting factors (Galaty 2008). This oversight might be corrected if archaeologists worked more closely with ceramic analysts who have been trained in materials science, archaeometry, and petrography, and are often potters themselves. Just such an approach was advocated by Matson (1965), who coined the term "ceramic ecology" to describe the relationship between resources, technology, and decision-making that characterizes pottery manufacture and distribution. Ceramic ecologists encourage archaeologists to identify and sample clays and tempers in their study region in order to provide interpretive contexts for analyzing and typing prehistoric pottery. Petrography is particularly useful in this regard, since petrographers can often precisely identify clays and inclusions in thin section.

To summarize, we can identify several key problems with the Type-Variety System, in particular as it has been applied in Eastern North America:

- Types, varieties, and wares are poorly defined, using overly qualitative terms;
- The number of types and varieties has proliferated to the point that published regional pottery typologies are not reproducible and applicable;
- It is unclear what types, varieties, and wares represent, limiting their utility for processual analysis; and
- Archaeologists working in Eastern North America have largely ignored ceramic-ecological contexts.

Setting an agenda for the study of cooking pots in the Aegean

The above, brief critique of the Type-Variety system, which was first applied to Eastern North America in the late 1950s and has been used and elaborated ever since, can help frame an agenda for the study of cooking pots (and coarse pottery in general) in the Aegean. If we act now, while the study of cooking pots in the Aegean is in its infancy, we can avoid critical mistakes made by North American archaeologists, mistakes that are now very difficult to correct. First and foremost, we can no longer justify discarding any pottery collected through survey or excavation, coarse or otherwise. If our methods generate too much pottery, those methods should be adjusted. Given modern archaeological ethics, the disposal of pottery because it is not "diagnostic" is indefensible. All pottery is potentially diagnostic, if kept and analyzed appropriately, since all pottery, including cooking pots, changed through time.

Second, the study of plain and coarse Aegean pottery, including cooking pots, should be a quantitative enterprise, based on a shared, trans-regional, scientific terminology, measuring ceramic attributes in ways that can be understood and reproduced by all archaeologists. These data should be collected in ways that allow and encourage probabilistic statistical analysis so that we can know whether patterns in our data are meaningful or random. Some of the contributors to this volume have tried to take just such a quantitative approach to their pottery (*e.g.*, Gulizio and Shelmerdine, Gorogianni *et al.*), but none apply even basic statistics. At a minimum, Aegean ceramic analysts should at least provide summary data in publication, such

as percentages of various types present in assemblages through time. Likewise, quantifiable terminology should be adopted and non-scientific descriptors (like "oatmeal" ware) should be discarded. In the absence of numbers, statistics, and meaningful, operationalizable terminology, Aegean archaeologists will generate non-reproducible typologies based on ill-defined, proliferating categories. This will render comparison across regions difficult or impossible and severely limit our ability to address historical, let alone processual, research questions using coarse pottery.

Third, we should adopt a deductive methodology that sets research questions in advance of analysis and relies on hypothesis testing. This will require us to be explicit about what we think we are studying when we analyze cooking pots. For example, if our goal is to use coarse pottery as chronological markers, and thereby address historical questions, this requires a particular kind of methodology, with the caveat that coarse pottery will not mark chronological horizons in the same way that painted pottery might. Conversely, if our goal is to use coarse pottery to address processual questions, we must carefully define such questions in advance and tailor our methods accordingly. For example, if we seek to reconstruct and compare diet across sites or regions through an analysis of cooking pots (as many contributors to this volume do), we must acquire data from cooking pots that are appropriate to that research question. Hruby (this volume) provides a good example of this kind of approach in her chapter on "souvlaki" trays.

Finally, all Aegean archaeologists working with pottery should know something about how pots are made. Ideally, they should work with ceramic analysts and employ a ceramic-ecological framework. Matson (1972), after all, did much of his work in Greece, in Messenia in particular. Those working with cooking pots should collect clays and temper samples in their study region and, if at all possible, employ a petrographer, who can help characterize pots and define meaningful differences between them. In fact, macroscopic analysis has the potential to mislead, allowing, for example, the misidentification of mineral inclusions (*e.g.* biotite versus muscovite mica) and temper (*e.g.* grog versus claystones), and should be combined with (and checked by) microscopic analysis.

To summarize, we should pursue the following general goals in our study of Mycenaean cooking pots:

- All coarse pottery should be kept and studied, regardless of whether it is "diagnostic";
- Archaeologists working with cooking pots should develop a shared terminology and classification system using categories of analysis that are quantifiable, non-overlapping, and reproducible;
- Summary data regarding pottery should be presented in publications and attribute data should be subjected to statistical analysis;
- A deductive methodology should be implemented that allows and encourages hypothesis testing; and
- A ceramic-ecological research framework should be adopted and pottery should be placed in ceramic-ecological context through ceramic-resources prospection and petrography.

To conclude this section, I would like to elaborate on each of these goals and provide specific suggestions about how to reach them. With regard to the first goal, archaeologists who discard coarse pottery typically do so because it does not appear to carry "diagnostic" information, *i.e.* decoration or measurable formal characteristics, such as rim, handle, or base. This argument is made by archaeologists, now in the minority (even in Greece), who see pots as "type fossils" only, as markers of chronological change. But the type-fossil approach to chronology is misleading because it creates artificial temporal thresholds that are often meaningless in historical (and processual) terms. So, for example, when Minyan ware appears in an excavation, the Middle Helladic has begun, *ca*. 2000 BC. When, however, a Minyan ware sherd is found in earlier or later contexts, the chronology is thrown off. This can also happen, of course, when archaeological contexts that have been defined based on pottery styles are radiocarbon dated earlier or later than expected, a more and more common occurrence in Greece.

Intuitively, we all know that the archaeological record does not conform to the expectations of the type-fossil approach. New pottery types are not there one moment and gone the next. They appear in the record, slowly gain in number, and then wane through time. This is the basis for frequency seriation dating of archaeological sites (Robinson 1951). When the percentages of a certain type are graphed through time, a so-called "battleship" curve is generated. When many types are graphed together, producing a series of curves, sites can be accurately dated, relative to one another. Mycenaean cooking pots, and coarse wares in general, if kept and properly analyzed, forming meaningful types, should provide the ideal conditions for seriation dating of Mycenaean sites. But I know of only one such study in Greece – one! –that of Cherry and Davis (1982) on Melos. It is thus essential that Aegean archaeologists keep all coarse pottery, create meaningful typologies, and present summary statistics, suitable for seriation. If this is not done, the loss to archaeology will continue to be tremendous, and Aegean archaeologists will become more and more befuddled when their ceramic chronological markers fail to match independently produced radiocarbon sequences.

Proper ceramic seriation depends on careful stratigraphic controls and the meaningful creation of ceramic types, particularly if these types are to be used by other analysts at other sites. A shared terminology for describing cooking pots is therefore needed. Terms are perhaps best drawn from sedimentary geology and soil science, as was done by Whitbread (1995) in his study of Greek transport amphorae. Whitbread's system of classification applies to both macro- and microscopic analysis of pottery and thus bridges the terminological gap between them. It is objective and quantifiable. For example, inclusions are measured and reported based on geological sorting sizes (in millimeters, as silts, sands, and gravels), rounding is checked against geological charts (and reported as angular, sub-angular, and rounded), and geological terms are employed, such as when voids are described. I strongly suggest that we adopt such a system for our analysis of cooking wares.

To some large degree, what one does with pottery, including cooking pots, depends on theoretical stance. Here I advocate a deductive approach that facilitates hypothesis testing. But how data from cooking pots are analyzed depends further on one's approach to archaeology generally. The archaeologists who developed the Type-Variety System employed inductive reasoning and expected pots to inform particular historical questions. Early Aegean archaeologists had similar agendas. Processual archaeologists employed deductive reasoning and expected pots to reveal past human behavioral patterning; there was a specific concern with evolutionary change. The Type-Variety System was not designed to answer processual questions, a problem compounded in Eastern North America by the dearth of contextual, ceramic-ecological data, but did, as described above, address change through time relatively well. Today's Aegean archaeologists, including contributors to this volume, appear to want to ask processual questions, and actually do a good job of incorporating ceramic-ecological data, including petrographic data, into their research, but their plain/coarse pottery typologies, including those for cooking pots, are not capable (yet) of addressing evolutionary change, making processual research difficult. This may be why many Aegean archaeologists, including several contributors to this book, have gravitated toward post-processual (*i.e*. "social") archaeology, which does not depend on evolutionary approaches and is particularistic in ways similar to traditional culture history. The temptation, therefore, will be to create Aegean ceramic typologies for coarse wares that mimic in complexity the Type-Variety System. However, this would be a serious mistake, for all the reasons outlined above. I would strongly encourage my Aegean colleagues, therefore, to build typologies that can accommodate studies of human behavior through time, since in fact utilitarian pottery is particularly sensitive to selective evolutionary change. An example drawn from Eastern North America will help clarify this point.

Studying cooking pots: a North American example

Archaeologists have long acknowledged that in the analysis of artifacts, function and style are two very different things. For example, evolutionary archaeologists have argued that functional traits are subject to "selection" and stylistic traits are subject to "drift" (O'Brien and Leonard 2001). Functional traits tend to change through time at gradual rates. They are introduced, drift, are adopted, spread through populations, and are eventually replaced; the process of seriation depends on this type of change. Stylistic traits, on the other hand, such as painted decoration, change rapidly and randomly. They are subject to stochastic introduction, variation and drift, followed by some adoption, and rapid replacement. As utilitarian items, Aegean cooking pots changed through time as a result of selection, not drift. To best classify them, therefore, we should produce typological systems based on functional traits, which, if our goal is to study behavioral processes, will best serve our needs.

The appearance and spread of shell tempering throughout Eastern North America at the start of the Mississippian period (*ca*. AD 800) illustrates well the differences between function and style (Feathers and Peacock 2008) and can serve as a case study for how changes in Aegean cooking pots might be studied. When added to pottery, burned, crushed shell improves resistance to thermal shock while acting to bind the clay matrix together, reducing cracking during the drying process. The result is a lighter, stronger vessel. Shell temper, once introduced, rapidly replaced sand and grog tempers at most sites in Eastern North America. The spread of shell tempering provides a textbook example of change through selection. Shell temper provided such large advantages over sand and grog tempering, in particular as maize agriculture spread, that within a generation most potters throughout most of Eastern North America had adopted it.

Originally, shell tempering was thought to have spread as the influence of Cahokia, the Mississippian capital located in present-day East St Louis, Illinois, spread. Thus, shell tempered pottery signaled political hegemony. More recently, though, archaeologists have developed much more complex models to explain the spread of shell tempering. Rafferty and Peacock (2008), for example, undertook seriation analysis at sites throughout the Black Prairie region of northern Mississippi and Alabama and found that shell tempering was in some cases adopted and in other cases spread through migration, and that the timing varied from site to site. It is therefore unlikely that shell tempering is indicative of Cahokian domination; rather, it seems that potters, probably women, chose to adopt shell tempering given its obvious advantages, and that the technology spread via word of mouth and through patrilocal marriage systems.

There are many attributes of Aegean cooking pots that could be subjected to similar types of analysis. For example, most of the papers in this volume address the introduction and spread of tripod legs. Like shell tempering, tripod legs are a functional solution to a problem related to diet and cooking. Presumably, an Aegean cook heated food in a cooking pot by placing it in hot coals, which eventually destroyed the pot. Tripod legs solved this problem by lifting the pot above the coals, allowing it to heat indirectly, extending the life of the pot. Careful seriation studies at a number of Aegean sites would allow us to determine exactly when, in relative terms, tripod legs were adopted and perhaps how and why. But for this to work, archaeologists at those sites would need to keep all coarse pottery, employ identical systems of classification, and keep and share summary data. In effect, they would need to adopt the goals I have outlined in this paper.

Conclusion

Shortly after the Type-Variety System appeared, it was subjected to a stinging critique written by Dunnell (1971).

> The direction in which solution [to the problem with the Type-Variety System] is to be sought lies not in Ptolemaic epicycles of further elaboration and specification, but in problem-oriented, thus testable, classifications explicitly defined and differentiated from the potsherds and projectile

points they are intended to order.

We are at a similar tipping point in the Aegean: we do not need more of our own types and varieties, we need problem-oriented approaches. This volume can help lead the way toward just such a framework. And we have the distinct advantage of building it from the ground up, avoiding mistakes made decades ago, still uncorrected, in the New World.

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